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MackKichan et al.

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(54) **TREE AND PLANT WATERING SYSTEMS**

USPC 47/21.1, 29.6, 30, 32, 32.4, 32.7, 33,
47/41.1, 41.14, 45, 46, 47, 70, 75
See application file for complete search history.

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Related U.S. Application Data

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(60) Provisional application No. 61/736,356, filed on Dec. 12, 2012, provisional application No. 61/753,189, filed on Jan. 16, 2013, provisional application No. 60/896,247, filed on Mar. 21, 2007, provisional application No. 61/365,838, filed on Jul. 20, 2010, provisional application No. 61/394,230, filed on Oct. 18, 2010.

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A01G 29/00 (2006.01)

(52) **U.S. Cl.**
CPC **A01G 29/00** (2013.01)

(58) **Field of Classification Search**
CPC A01G 29/00; A01G 25/02; A01G 27/02;
A01G 27/06; A01G 27/006

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Primary Examiner — Kristen C Hayes

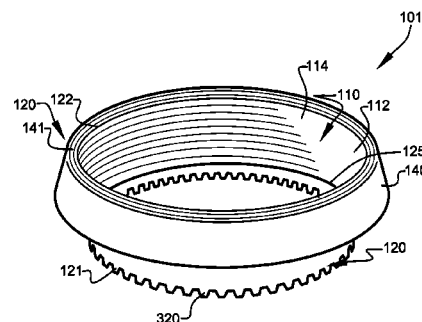
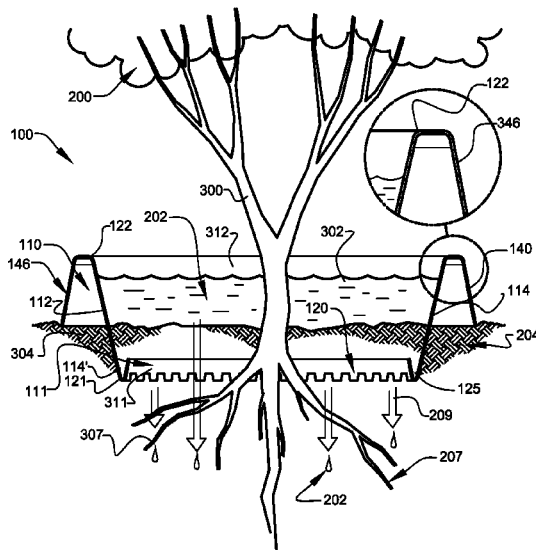
Assistant Examiner — Ebony Evans

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Raymond J. E. Hall

(57) **ABSTRACT**

A tree and plant watering system relating to improved transfer of water to trees and plants (both new and existing) is provided. The system comprises soil penetrators, soil anchors, and area extenders to enhance water capacity and to provide ease of water transfer to root systems. Additionally, the system provides plant growth ladders to assist upward plant growth and root apertures to assist root growth.

19 Claims, 16 Drawing Sheets



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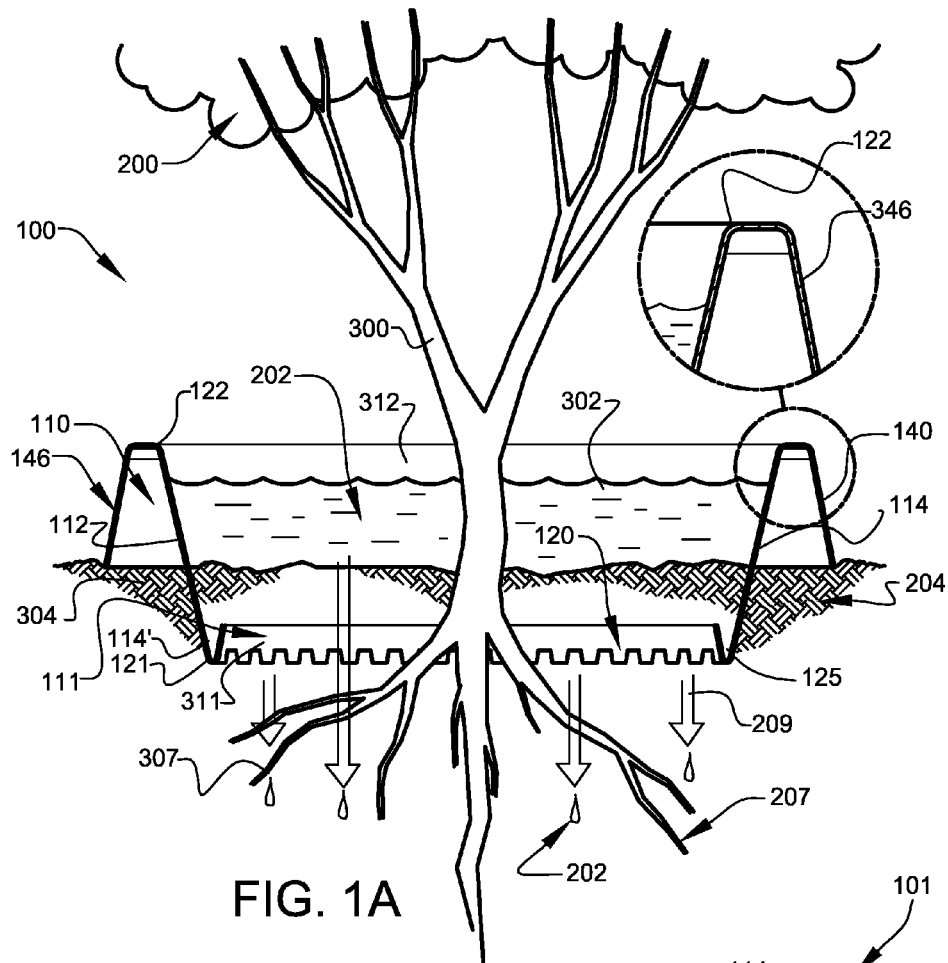


FIG. 1A

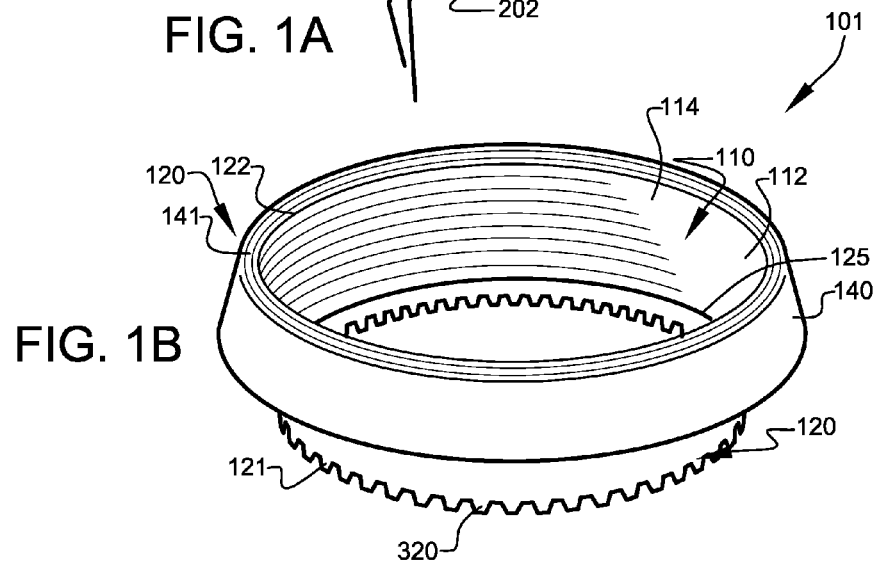


FIG. 1B

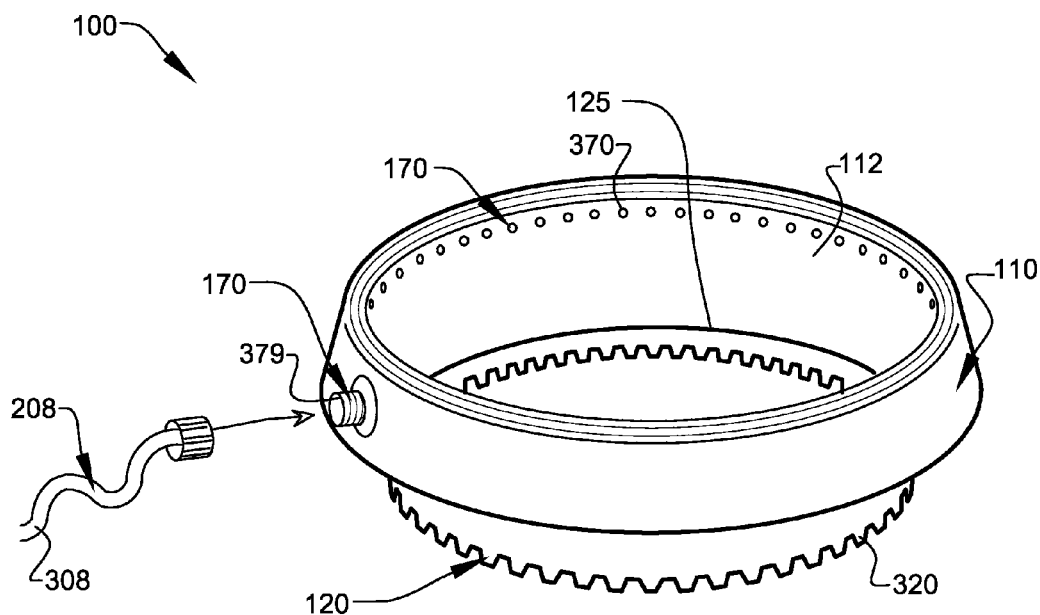


FIG. 2A

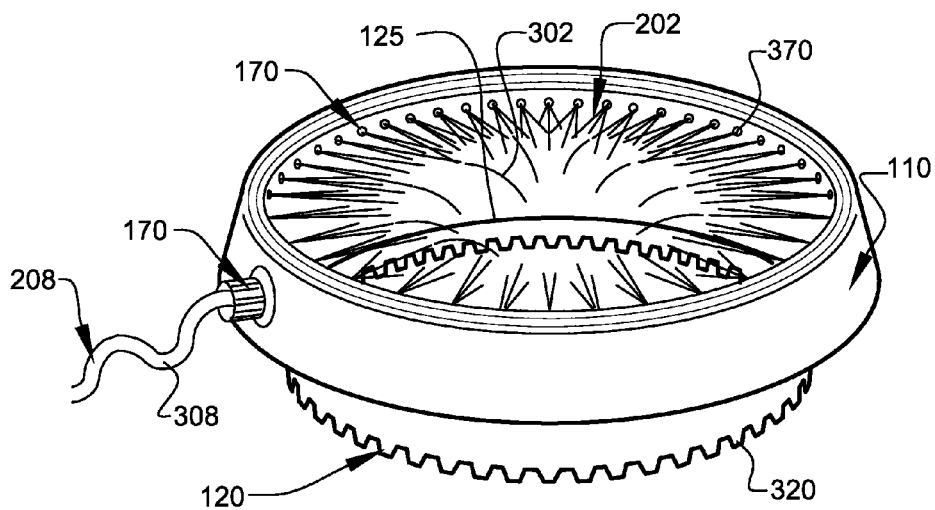


FIG. 2B

REPLACEMENT SHEET

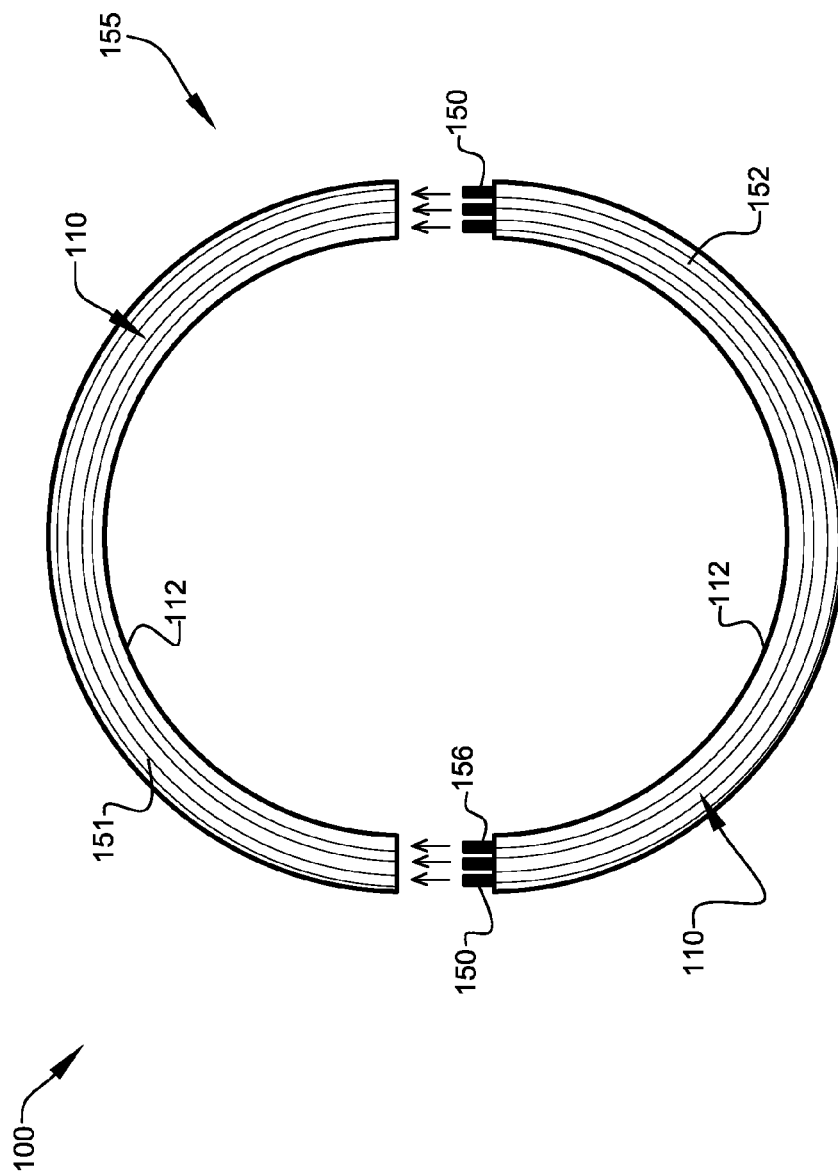


FIG. 3

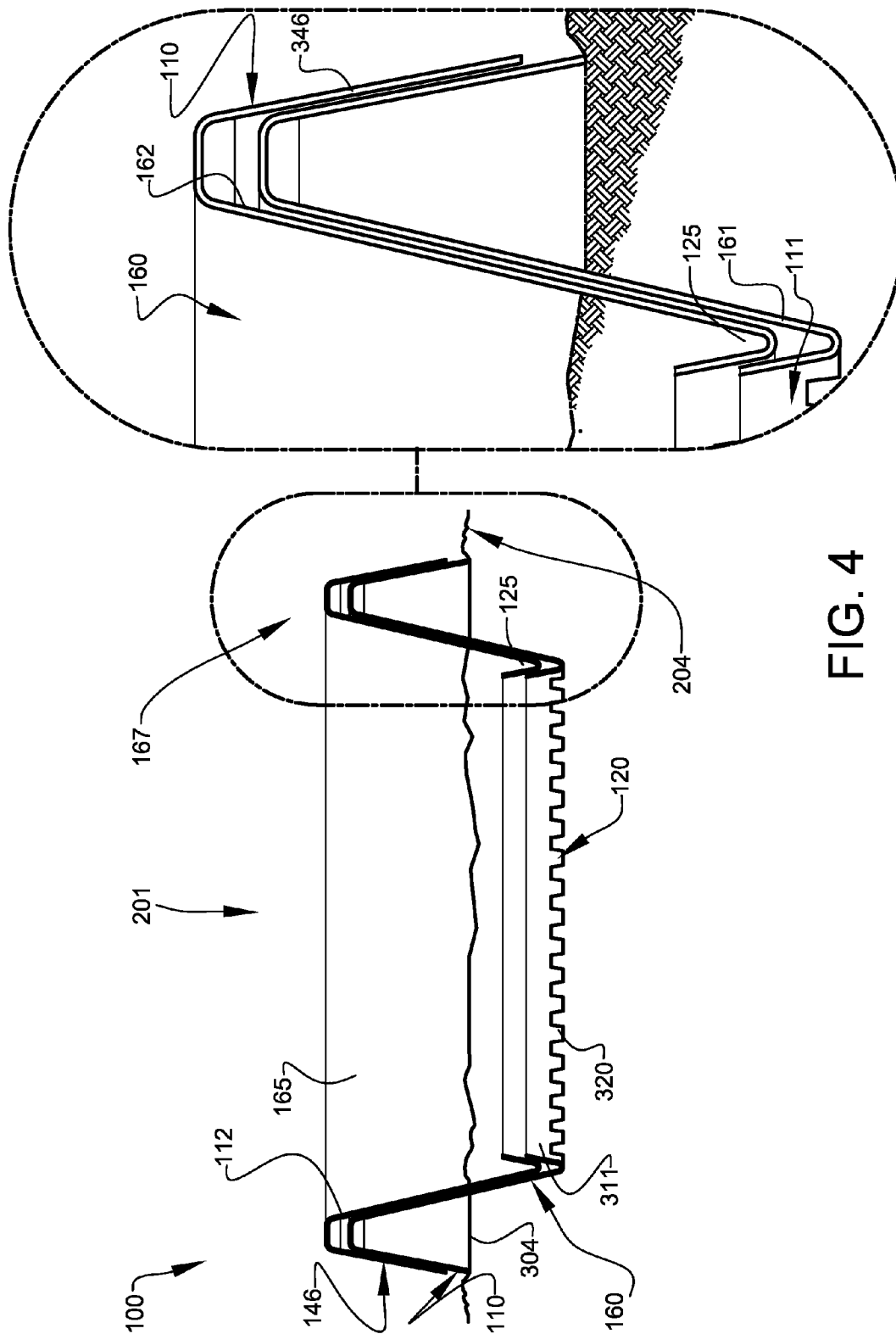


FIG. 4

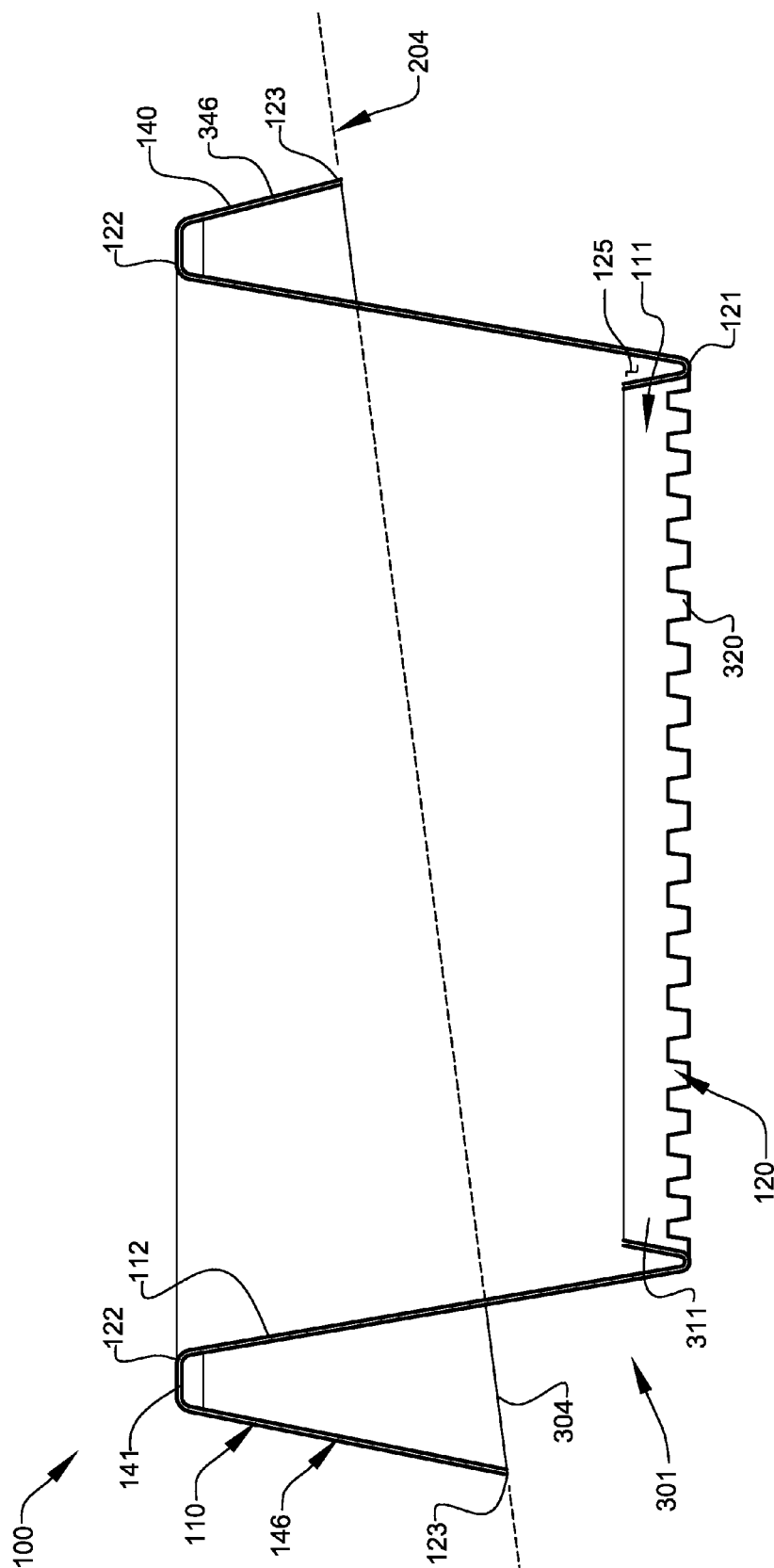


FIG. 5

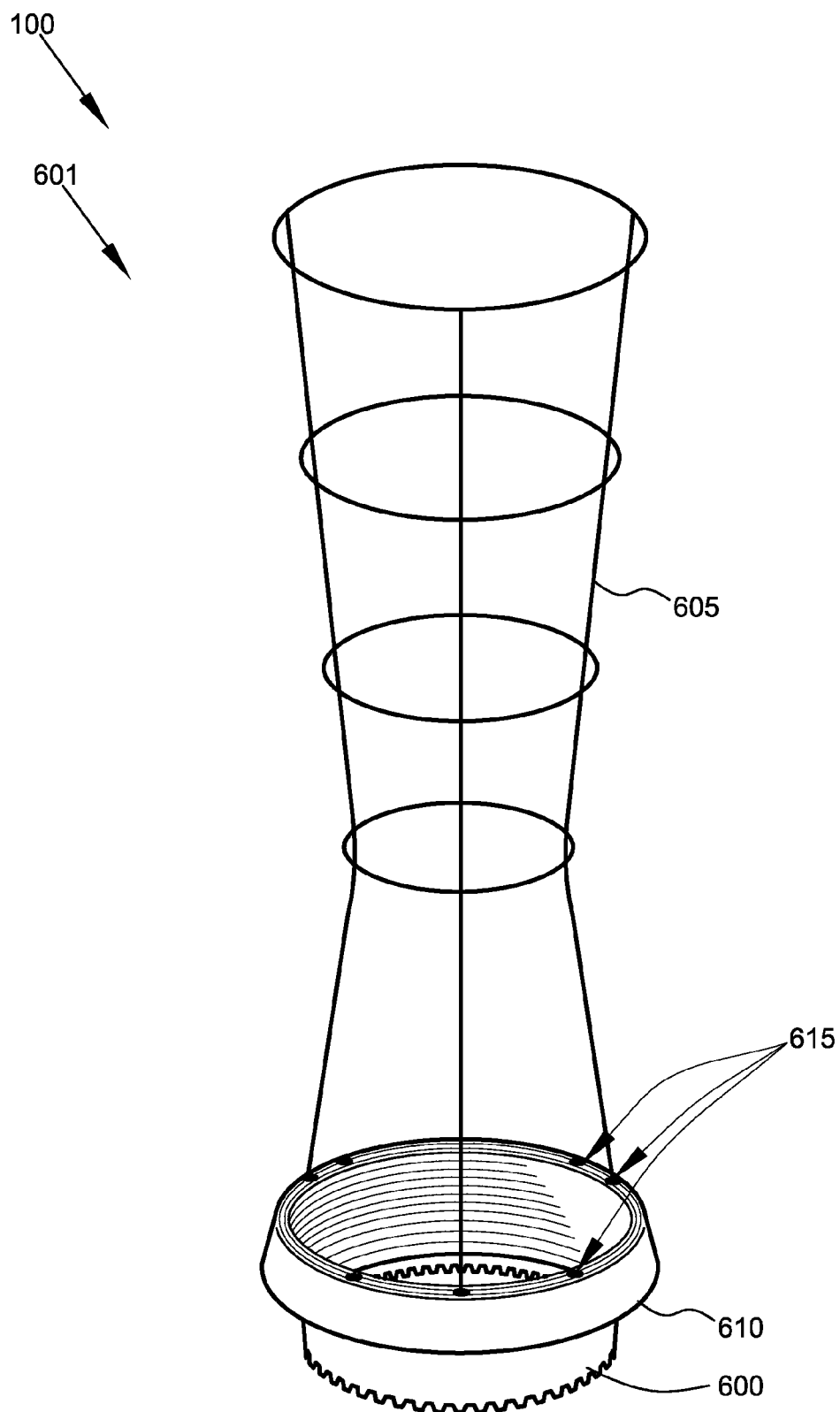


FIG. 6

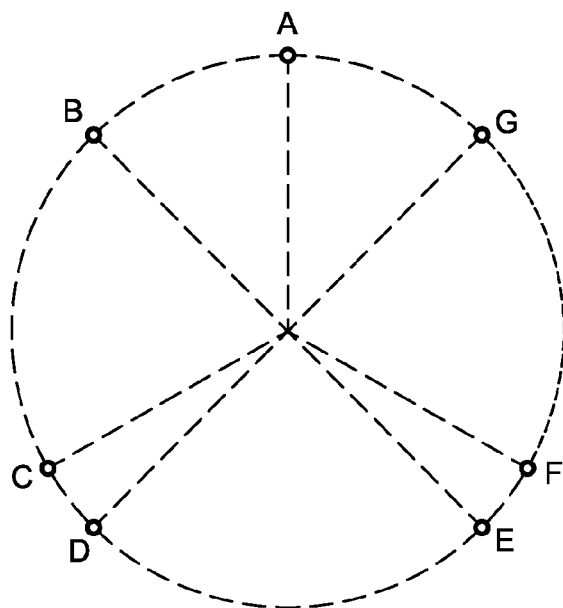


FIG. 7

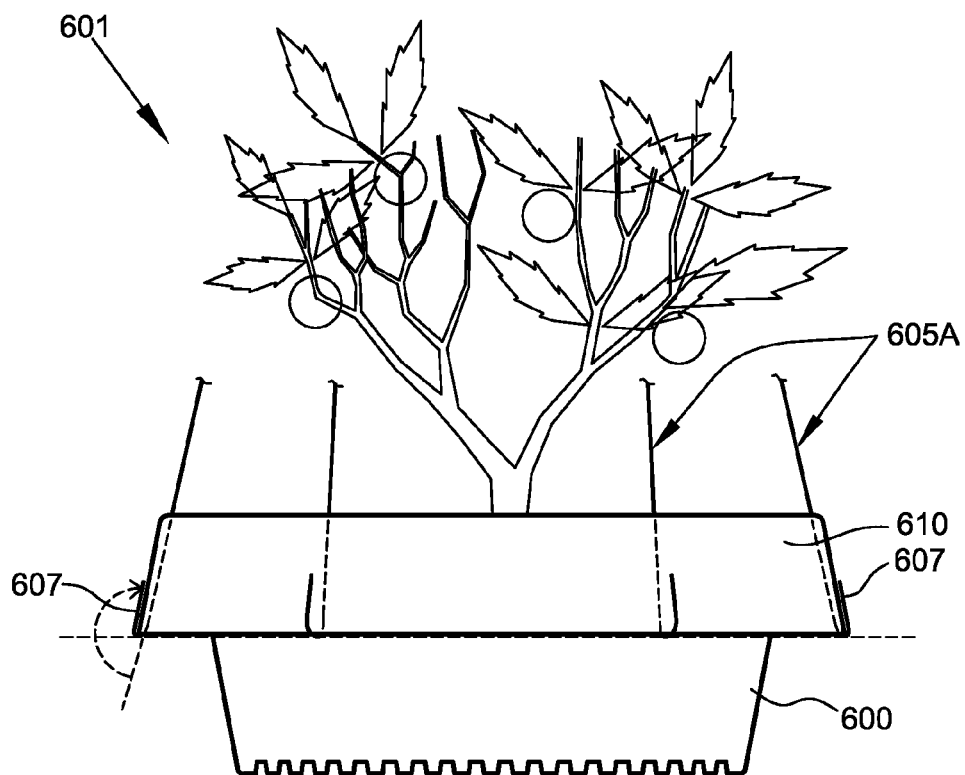


FIG. 8

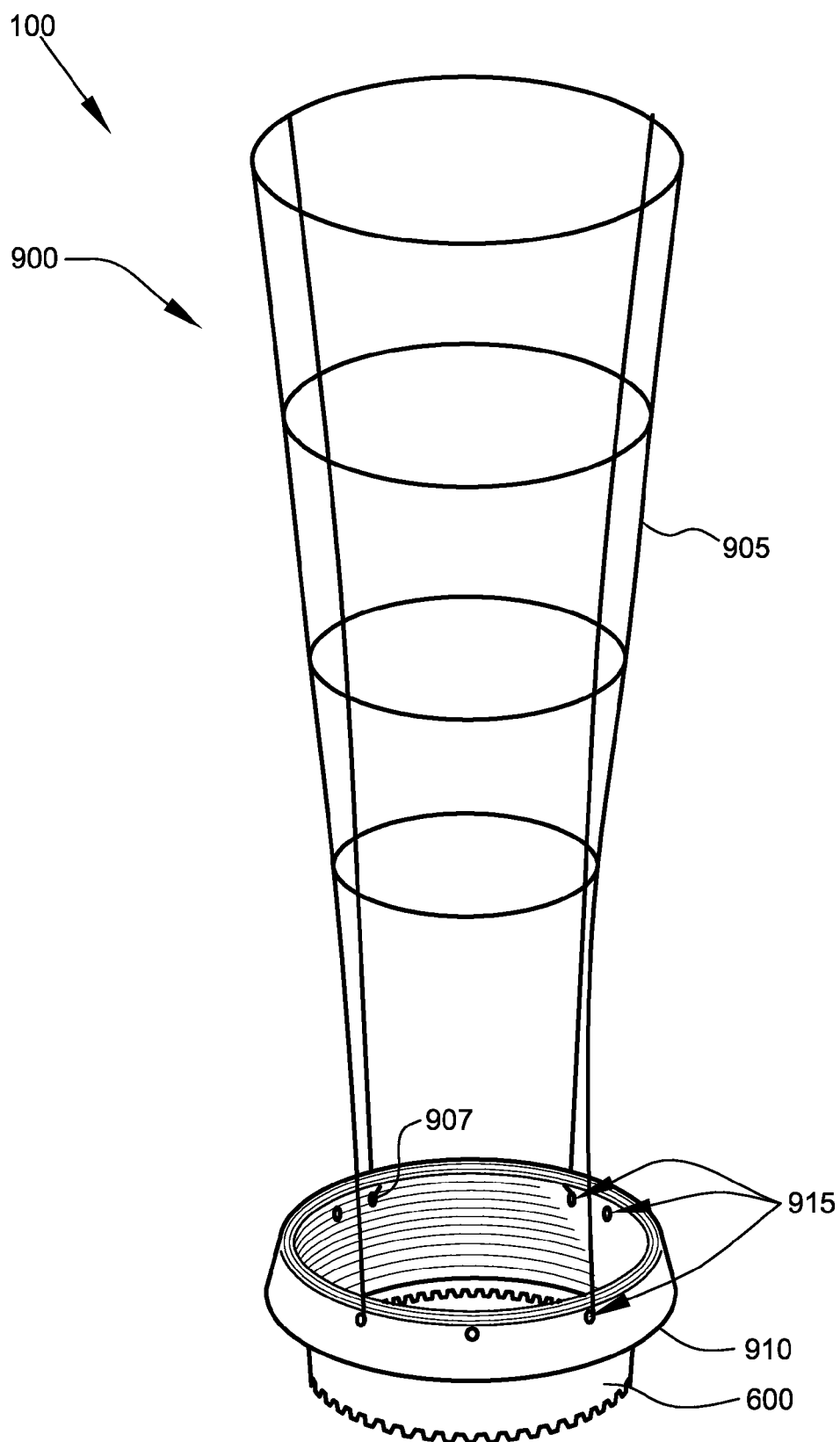


FIG. 9

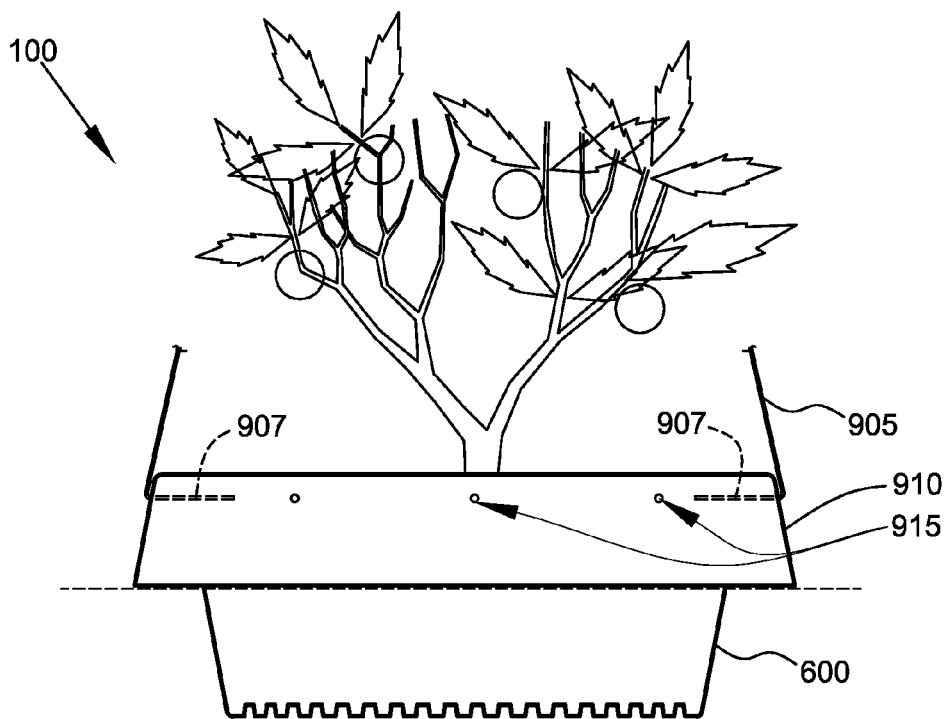


FIG. 10

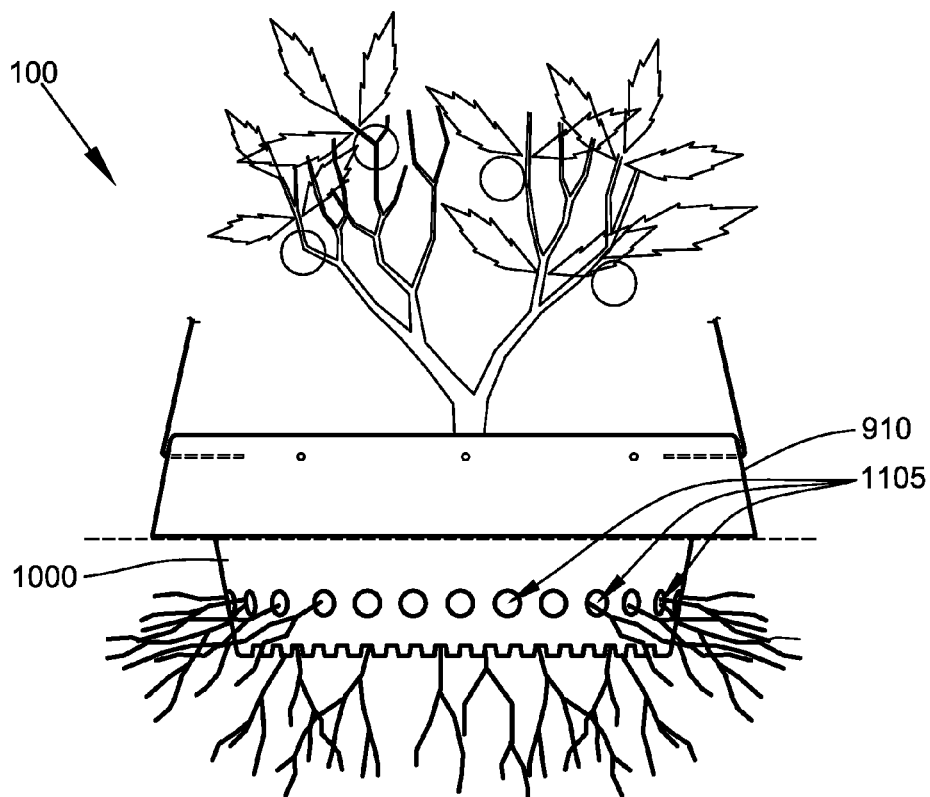


FIG. 11

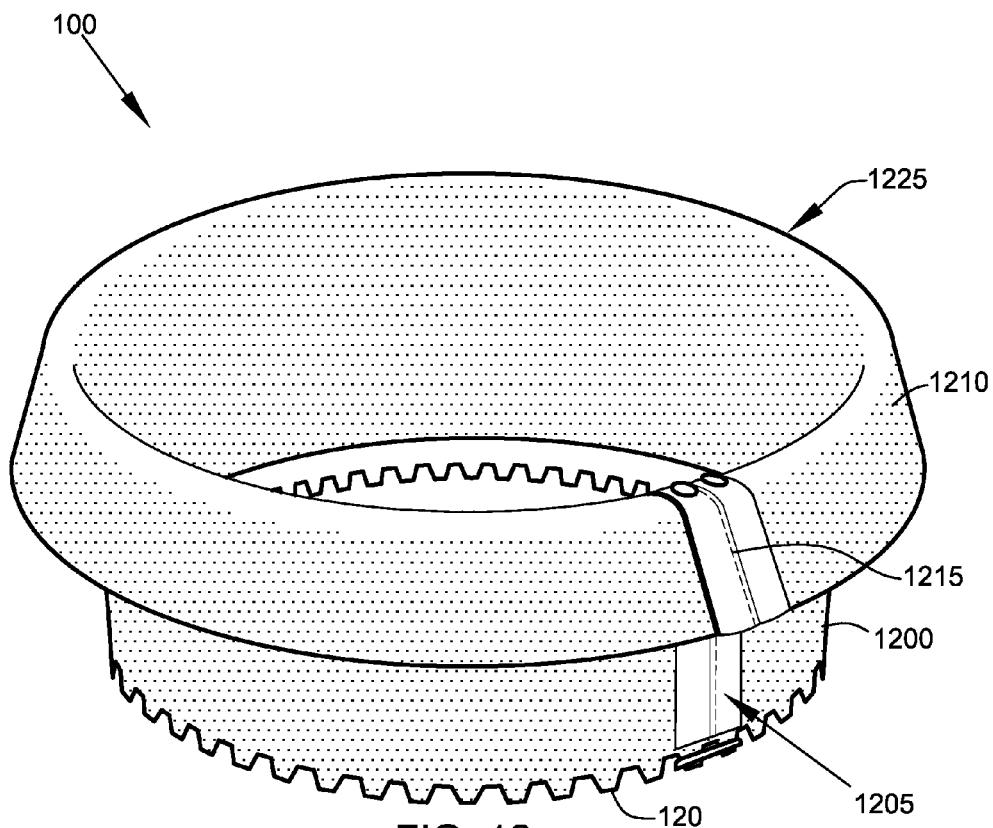


FIG. 12

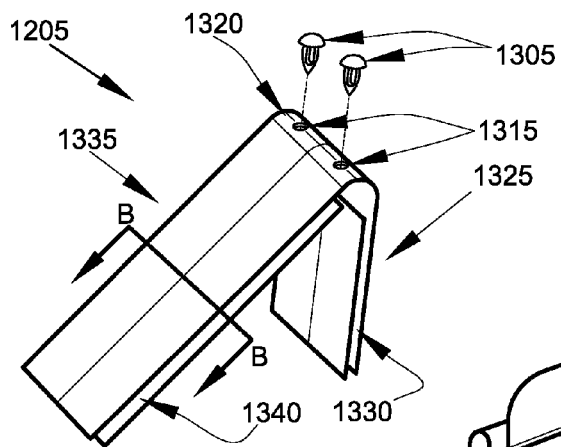


FIG. 13A

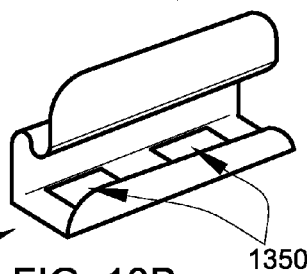


FIG. 13B

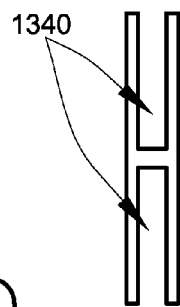


FIG. 14

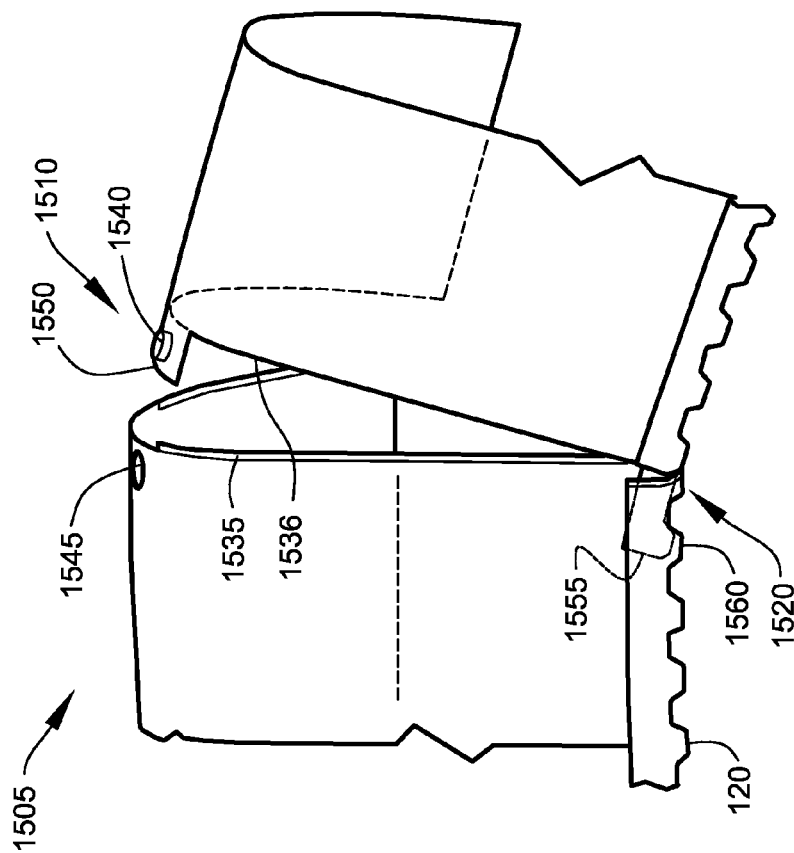


FIG. 15

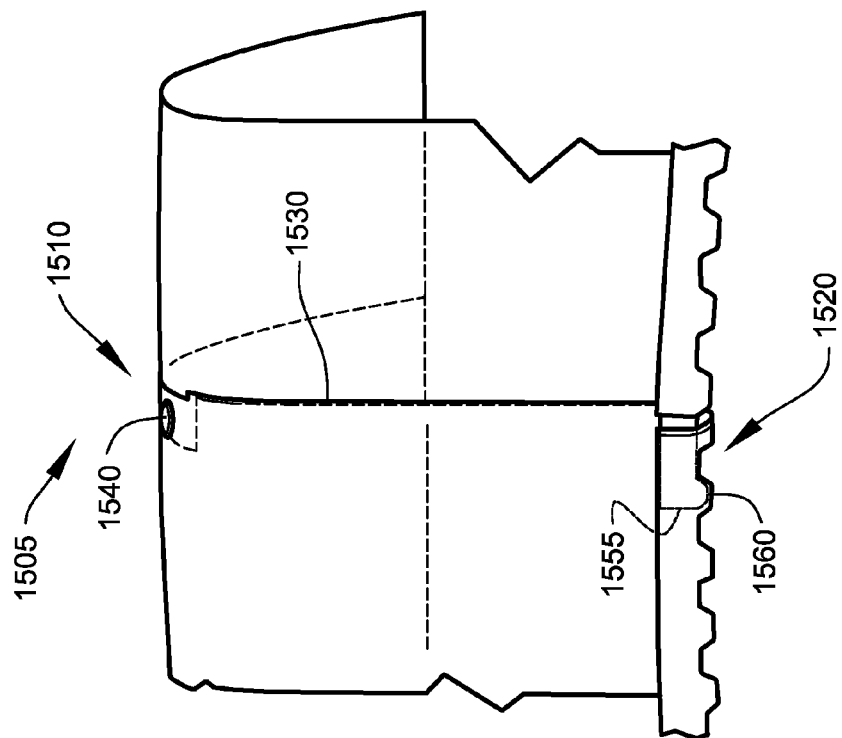
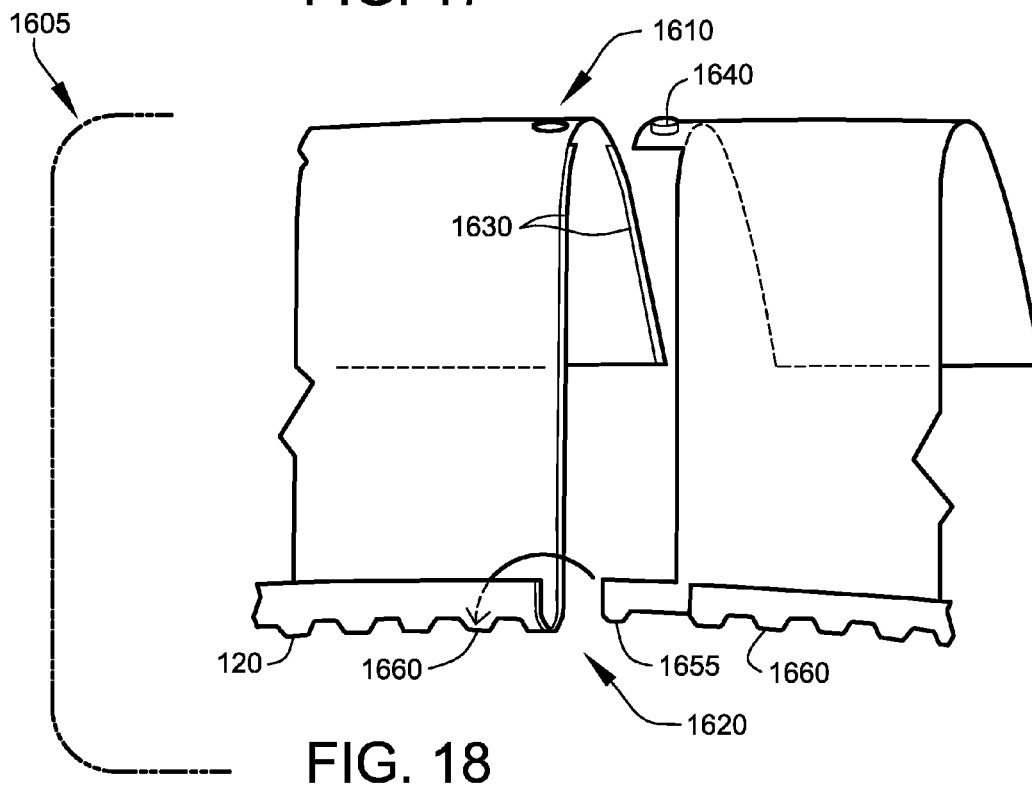
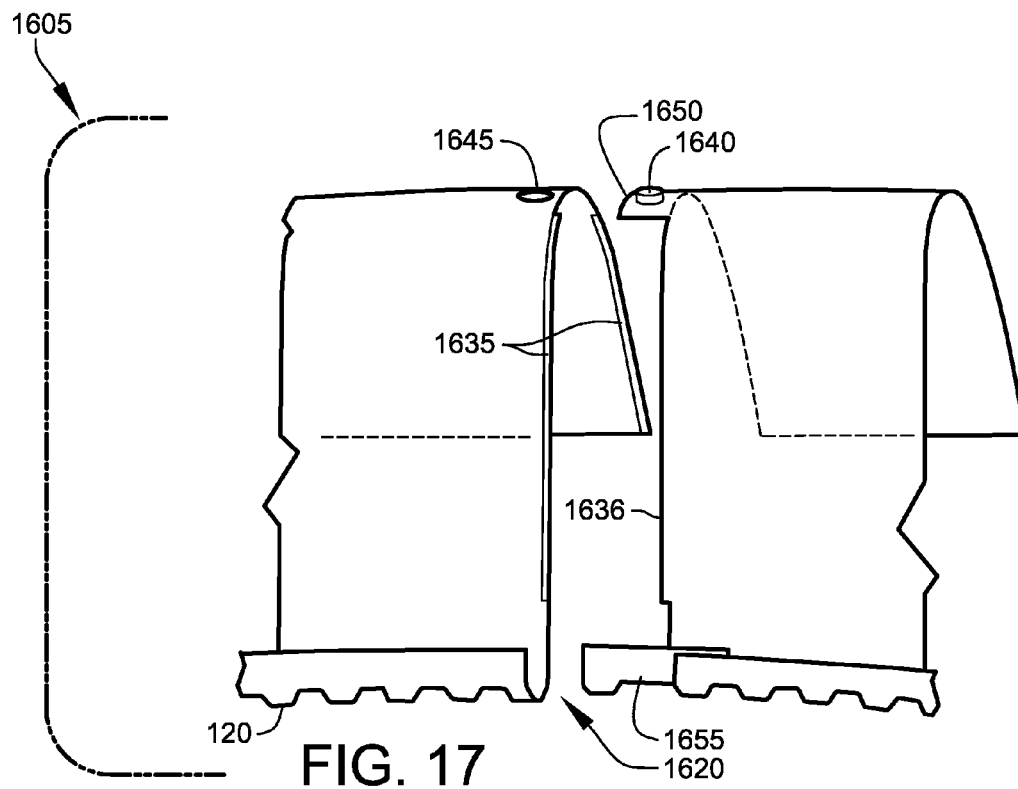


FIG. 16



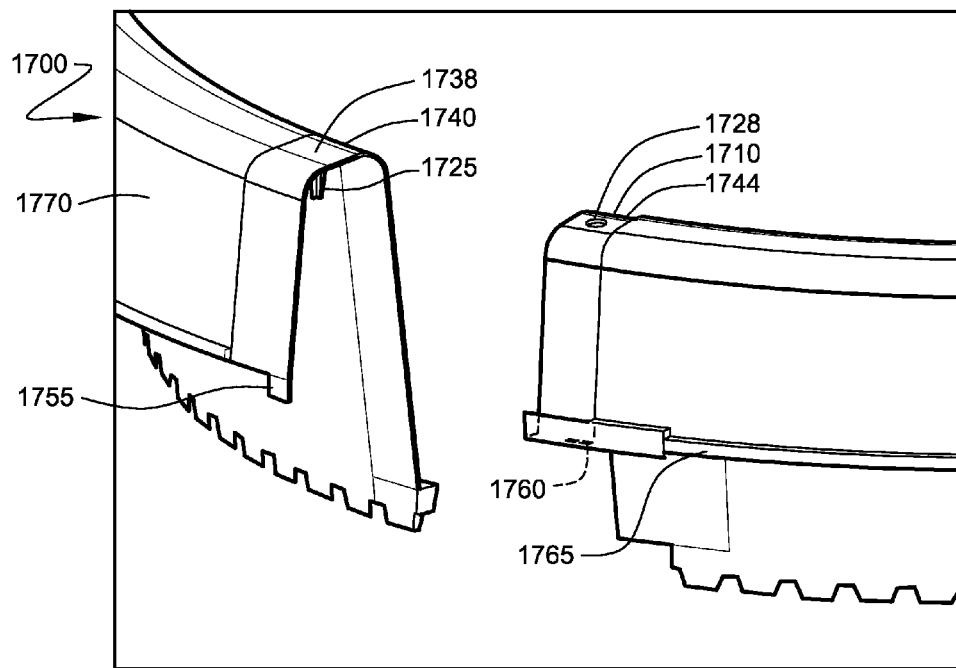
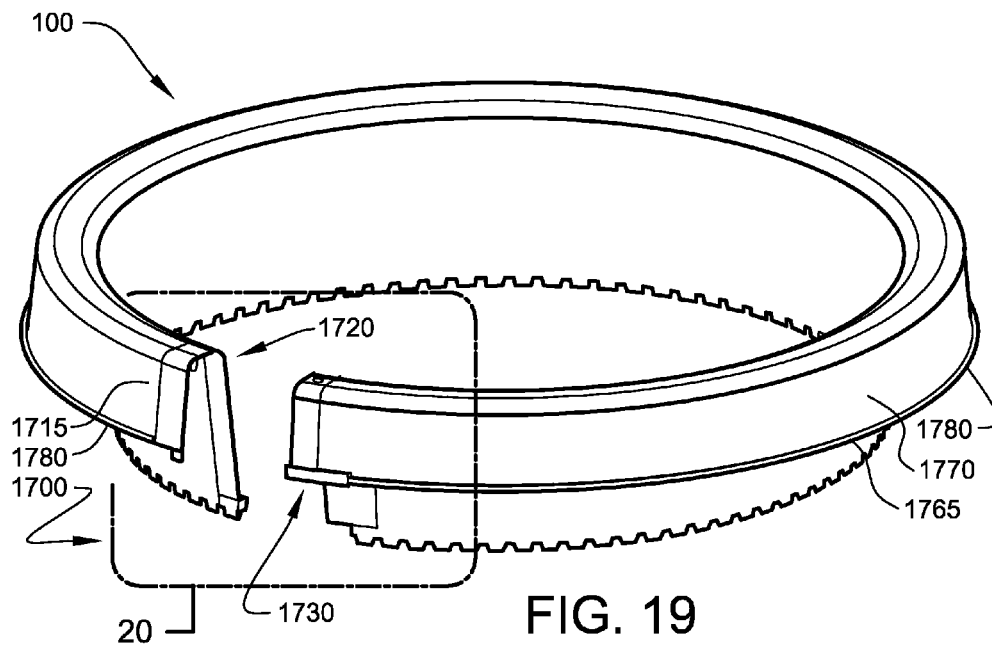


FIG. 20

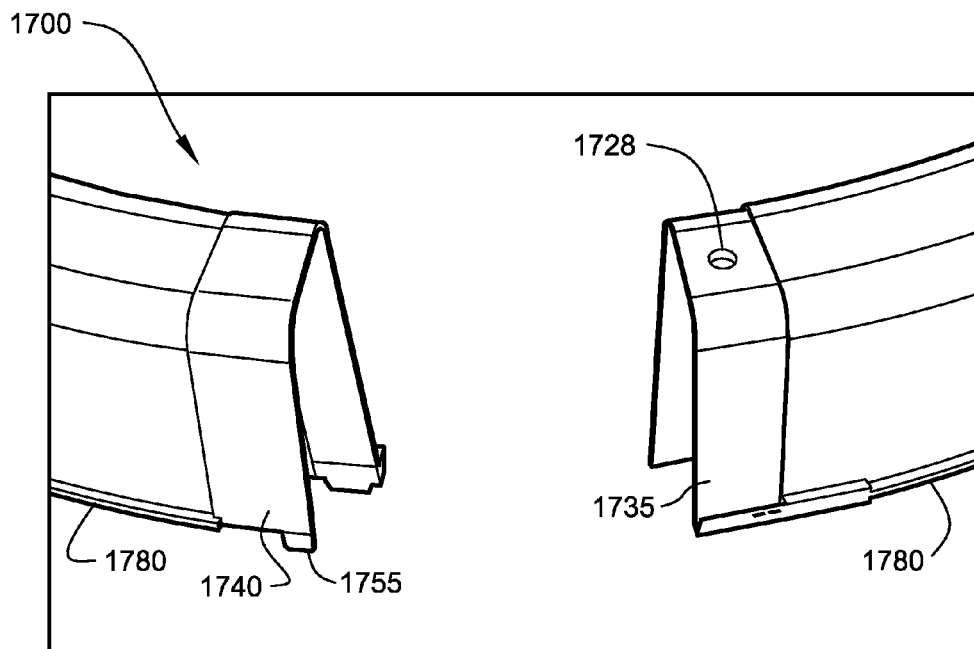


FIG. 21

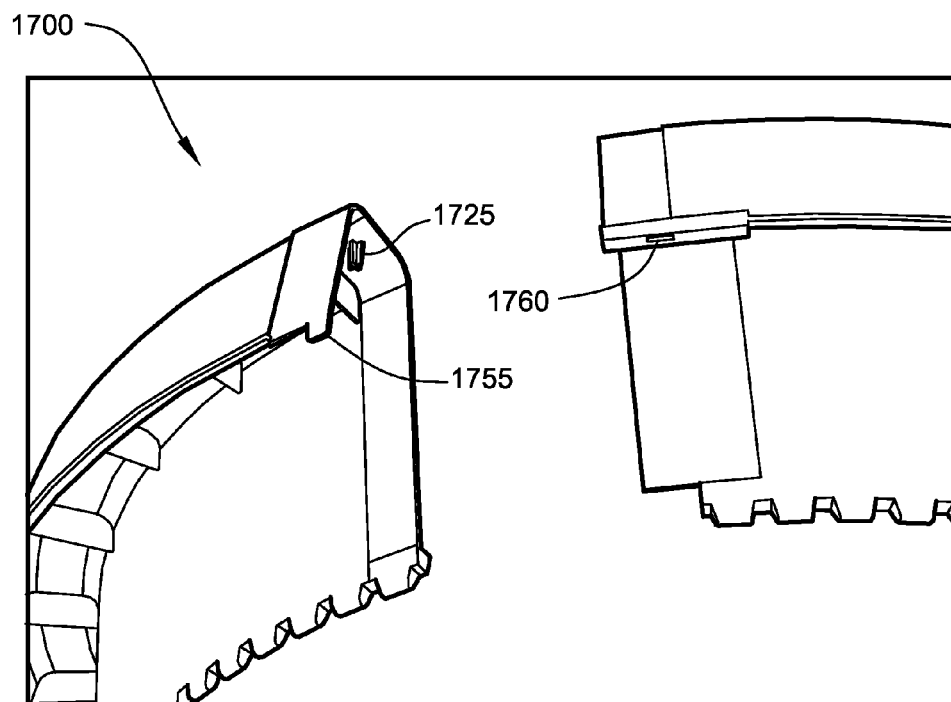


FIG. 22

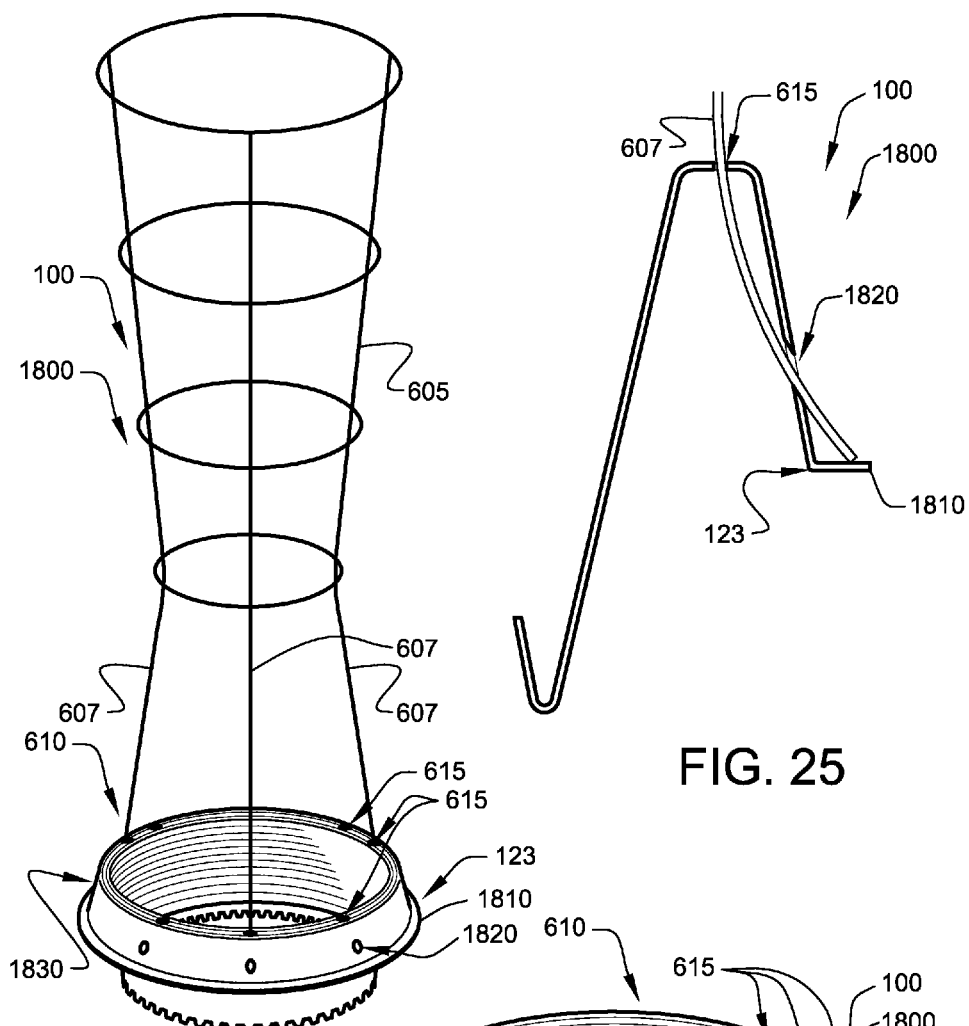


FIG. 25

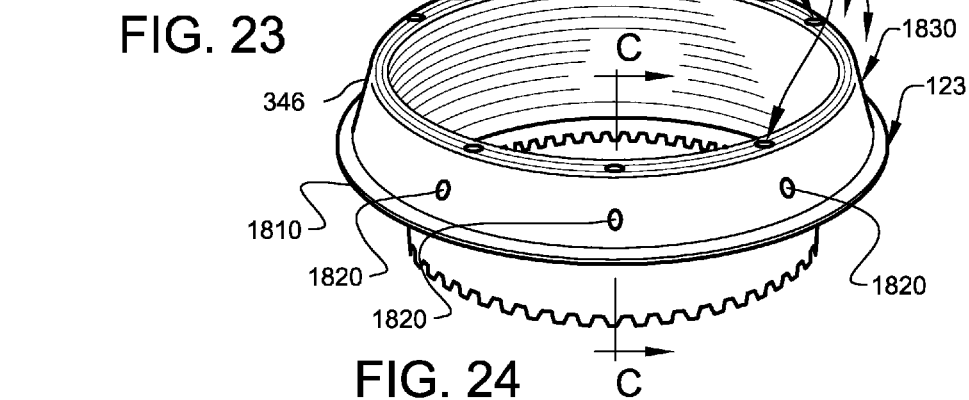


FIG. 24

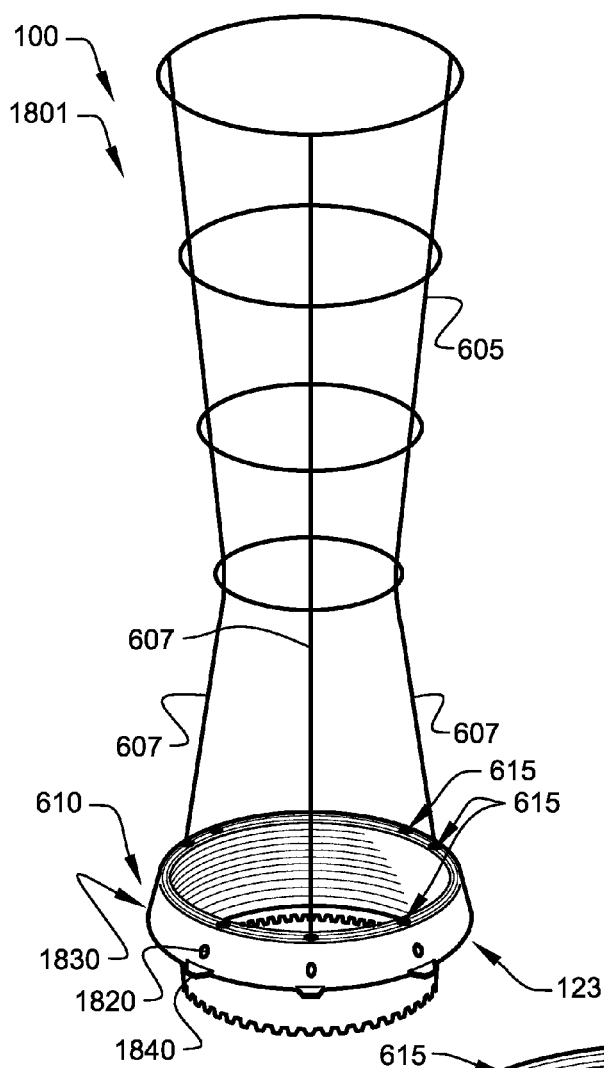


FIG. 26

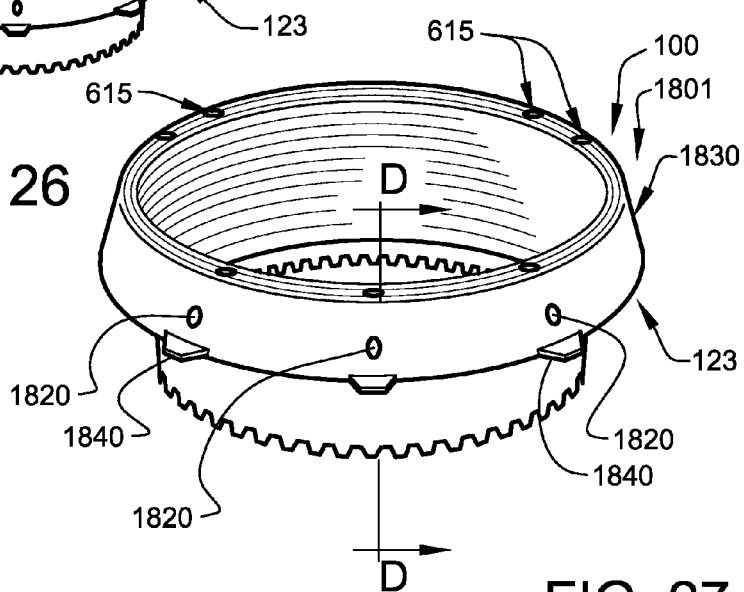


FIG. 27

TREE AND PLANT WATERING SYSTEMS**CROSS-REFERENCE TO RELATED APPLICATION**

The present application is a continuation-in-part of, and is related to and claims priority from, application Ser. No. 13/043,399, filed Mar. 8, 2011, entitled "TREE AND PLANT WATERING SYSTEMS", which is a continuation-in-part of, and is related to and claims priority from, application Ser. No. 12/053,175, filed Mar. 21, 2008, entitled "WATER ROUNDS SYSTEMS", which prior application is related to and claims priority from prior provisional application Ser. No. 60/896,247, filed Mar. 21, 2007, entitled "WATER ROUNDS SYSTEMS"; and, which is related to and claims priority from prior provisional application Ser. No. 61/365,838, filed Jul. 20, 2010, entitled "TREE AND PLANT WATERING SYSTEMS"; and, which is related to and claims priority from prior provisional application Ser. No. 61/394,230, filed Oct. 18, 2010, entitled "TREE AND PLANT WATERING SYSTEMS"; and, this application is related to and claims priority from prior provisional application Ser. No. 61/736,356, filed Dec. 12, 2012, entitled "TREE AND PLANT WATERING SYSTEMS"; and, this application is related to and claims priority from prior provisional application Ser. No. 61/753,189, filed Jan. 16, 2013, entitled "TREE AND PLANT WATERING SYSTEMS", the contents of all of which are incorporated herein by this reference and are not admitted to be prior art with respect to the present invention by the mention in this cross-reference section.

BACKGROUND

This invention relates to plants and other organisms having root systems. More particularly, this invention relates to providing systems for the improved transfer of fluids to plants and other organisms having root systems. Furthermore, this invention relates to successfully containing fluids in the area surrounding plants as well as the area surrounding other organisms having root systems.

Typically, plants are relatively difficult to transfer fluids to, a factor which greatly affects the health and vitality of the plant. Therefore, a need exists for improved fluid transfer, providing greater plant health and vitality specifically through effective fluid containment in the area surrounding plant root systems.

OBJECTS AND FEATURES OF THE INVENTION

A primary object and feature of the present invention is to provide tree and plant watering systems to overcome the above-described problem(s). It is a further object and feature of the present invention to provide such a system comprising containment in the area surrounding plant root systems. A further object and feature of the present invention is to provide such a system comprising soil penetrators. Yet another object and feature of the present invention is to provide such a system comprising soil anchors.

Furthermore, it is an object and feature of the present invention to provide such a system comprising plant protectors, containers, and/or container connectors.

It is another object and feature of the present invention to provide such a system comprising container holders and contoured grips. It is yet another object and feature of the present invention to provide such a system comprising tree

and plant watering systems expanders. A further object and feature of the present invention is to provide such a system comprising fluid transmitters. Also, it is an object and feature of the present invention to provide such a system comprising reinforcers.

A further object and feature of the present invention is to provide such a system comprising plant growth ladders. A further object and feature of the present invention is to provide such a system comprising root apertures for promoting root growth beyond such containment. A further object and feature of the present invention is to provide such a system comprising tomato vine cages.

A further object and feature of the present invention is to provide such a system comprising an apparatus capable of being separated to assist being placed around existing plantus and then being coupled together. A further object and feature of the present invention is to provide such a system wherein such apparatus coupling provides a water-holding seal.

Another object and feature of the present invention is to provide such a system having a tilt stabilizer to prevent tilting in loose or muddy soil. A further object and feature of the present invention is to provide such a system having tomato cage orientation stabilizers.

A further primary object and feature of the present invention is to provide such a system that is efficient, inexpensive, and handy. Other objects and features of this invention will become apparent with reference to the following descriptions.

SUMMARY OF THE INVENTION

In accordance with a preferred embodiment hereof, this invention provides a system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: at least one surrounder structured and arranged to radially surround the at least one plantus; wherein such at least one surrounder comprises at least one container structured and arranged to contain the at least one fluid when such at least one surrounder is embedded in the at least one soil; wherein such at least one surrounder comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; wherein such at least one surrounder comprises at least one penetrator structured and arranged to penetrate the at least one soil; and wherein such at least one surrounder comprises at least one separation element, having at least one first end portion and at least one second end portion, structured and arranged to provide separation of such at least one surrounder to assist such radial installation of such at least one surrounder around the at least one plantus.

Moreover, it provides such a system wherein such at least one surrounder comprises: at least one inner ring portion; at least one outer ring portion; and at least one ledge portion connecting such at least one inner ring portion and such at least one outer ring portion; wherein such at least one separation element provides at least one separation to such at least one inner ring portion, such at least one outer ring portion, and such at least one ledge portion; wherein such at least one inner ring portion comprises at least one first connector element structured and arranged to connect such at least one separation element of such at least one inner ring portion; wherein such outer ring portion comprises at least one second connector element structured and arranged to connect such at least one separation element of such at least one outer ring portion; wherein such at least one ledge

portion comprises at least one third connector element structured and arranged to connect such at least one separation element of such at least one ledge portion; and wherein when such at least one inner ring portion is connected by such at least one first connector element, such at least one outer ring portion is connected by such at least one second connector element, and such at least one ledge portion is connected by such at least one third connector element such at least one surrounder is not separated.

Additionally, it provides such a system wherein at least one first connector element comprises: at least one first pin structured and arranged to be placed into at least one first pin aperture; wherein such at least one first pin is situated on one of such at least one first end portion or such at least one second end portion end of such at least one separation element; wherein such at least one first pin aperture is situated on the other end of such at least one separation element; and wherein placement of such at least one first pin into such at least one first pin aperture connects such at least one separation element of such at least one inner portion. Also, it provides such a system wherein at least one second connector element comprises: at least one first second pin structured and arranged to be placed into at least one of at least two second pin apertures; at least one second second pin structured and arranged to be placed into at least one other of at least two second pin apertures; wherein such at least one first second pin is situated on one of such at least one first end portion or such at least one second end portion of such at least one separation element; wherein such at least one second second pin is situated on the other end of such at least one separation element; wherein such at least two second pin apertures comprise at least one removable coupling element structured and arranged to couple together such at least one first second pin and such at least one second second pin; and wherein placement of such at least one first second pin into such at least one removable coupling element and such at least one second pin into such into such at least one removable coupling element connects such at least one separation element of such at least one outer portion.

In addition, it provides such a system wherein at least one third connector element comprises: at least one third pin structured and arranged to be placed into at least one third pin aperture; wherein such at least one third pin is situated on one of such at least one first end portion or such at least one second end portion of such at least one separation element; wherein such at least one third pin aperture is situated on the other end of such at least one separation element; and wherein placement of such at least one third pin into such at least one third pin aperture connects such at least one separation element of such at least one ledge portion. And, it provides such a system wherein such at least one removable coupling element comprises at least one clip structured and arranged to connected opposite such at least one first second pin and such at least one second second pin. Further, it provides such a system wherein such at least one surrounder comprises: at least one inner face situated on the innermost diameter of such at least one surrounder; and at least one anchor structured and arranged to anchor such at least one surrounder to the at least one soil; wherein such at least one anchor is situated along such at least one inner face. Even further, it provides such a system wherein such at least one anchor comprises at least one flange situated along such at least one inner face. Even further, it provides such a system wherein such at least one flange comprises at least one sloped portion sloping from such at least one inner face to an about v-shaped edge and sloping upwardly and outwardly therefrom to create at least one trough-shaped flange.

Even further, it provides such a system wherein such at least one surrounder comprises at least one connector structured and arranged to connect such at least one first end portion and such at least one second end portion.

Even further, it provides such a system wherein such at least one connector comprises: at least one channeled connecting member to receive such at least one first end portion and such at least one second end portion; and at least one fastener to secure such at least one channeled connecting member to such at least one surrounder. Even further, it provides such a system wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surrounder during penetration. Even further, it provides such a system wherein such at least one surrounder comprises at least one expander element structured and arranged to expand the fluid capacity of such at least one surrounder. Even further, it provides such a system wherein: such at least one expander element comprises at least one first surrounder layer and at least one second surrounder layer; and such at least one second surrounder layer extends away from such at least one first surrounder layer, expanding the fluid capacity of such at least one surrounder immediately surrounding the at least one plantus. Even further, it provides such a system wherein such at least one surrounder comprises at least one fluid transmitter structured and arranged to transmit at least one fluid from the at least one fluid source. Even further, it provides such a system wherein such at least one penetrator comprises at least one tooth. Even further, it provides such a system wherein such at least one surrounder comprises at least one nested-stacking element structured and arranged to assist nested stacking of a plurality of such at least one surrounders.

In accordance with a preferred embodiment hereof, this invention provides a system, related to providing at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: surrounder means for radially surrounding the at least one plantus; wherein such surrounder means comprises container means for containing the at least one fluid; wherein such surrounder means comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; and wherein such surrounder means comprises penetrator means for penetrating the at least one soil. Also, it provides such a system wherein such surrounder means comprises protector means for protecting the at least one plantus. In addition, it provides such a system wherein such surrounder means comprises anchor means for anchoring such surrounder means into the at least one soil. And, it provides such a system wherein such surrounder means comprises: at least one first portion; at least one second portion; and connector means for connecting such at least one first portion and such at least one second portion.

Further, it provides such a system wherein such penetrator means comprises holder means for holding such surrounder means during penetration. Even further, it provides such a system wherein such surrounder means comprises expander means for expanding the capacity to contain the at least one fluid. Moreover, it provides such a system wherein such expander means comprises at least one first layer and at least one second layer whereby such at least one second layer extends away from such at least one first layer, providing an increase in the size of the area immediately surrounding the at least one plantus.

Additionally, it provides such a system wherein such surrounder means comprises transmitter means for transmitting the at least one fluid from the at least one fluid source.

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Also, it provides such a system wherein such transmitter means comprises at least one sprinkler. In addition, it provides such a system wherein such penetrator means comprises at least one tooth. And, it provides such a system wherein such surrounder means comprises at least one plastic.

In accordance with another preferred embodiment hereof, this invention provides a system, related to providing at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: At least one surrounder structured and arranged to radially surround the at least one plantus; wherein such at least one surrounder comprises at least one container structured and arranged to contain the at least one fluid; wherein such at least one surrounder comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; and wherein such at least one surrounder comprises at least one penetrator structured and arranged to penetrate the at least one soil. Further, it provides such a system wherein such at least one surrounder comprises at least one protector structured and arranged to protect the at least one plantus. Even further, it provides such a system wherein such at least one surrounder comprises at least one anchor structured and arranged to anchor such at least one surrounder to the at least one soil. Moreover, it provides such a system wherein such at least one surrounder comprises: at least one first portion; at least one second portion; and at least one connector structured and arranged to connect such at least one first portion and such at least one second portion.

Additionally, it provides such a system wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surrounder during penetration. Also, it provides such a system wherein such at least one surrounder comprises at least one expander structured and arranged to expand the capacity to contain the at least one fluid. In addition, it provides such a system wherein such at least one expander comprises at least one first layer and at least one second layer whereby such at least one second layer extends away from such at least one first layer, providing an increase in the size of the area immediately surrounding the at least one plantus. And, it provides such a system wherein such at least one surrounder comprises at least one transmitter structured and arranged to transmit the at least one fluid from the at least one fluid source.

Further, it provides such a system wherein such at least one transmitter comprises at least one sprinkler. Even further, it provides such a system wherein such at least one penetrator comprises at least one tooth. Even further, it provides such a system wherein such at least one surrounder comprises at least one plastic. Even further, it provides such a system wherein such at least one holder comprises contours. Even further, it provides such a system whereby such near edge penetrates to a depth greater three inches. Even further, it provides such a system wherein the distance between such near edge and such far edge grades. Even further, it provides such a system wherein such far edge of such at least one surrounder tapers away from the at least one plantus with respect to such near edge. Even further, it provides such a system wherein such near edge is more than three inches from such far edge. Even further, it provides such a system wherein such at least one penetrator comprises at least one kickplate. Even further, it provides such a system wherein said: at least one surrounder comprises at least one anchor structured and arranged to anchor such at least one surrounder to the at least one soil; at least one surrounder

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comprises at least one plastic; at least one penetrator comprises at least one tooth; and at least one holder comprises contours.

In accordance with a preferred embodiment hereof, this invention provides a system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: at least one surrounder structured and arranged to radially surround the at least one plantus; wherein such at least one surrounder comprises at least one container structured and arranged to contain the at least one fluid when such at least one surrounder is embedded in the at least one soil; wherein such at least one surrounder comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; wherein such at least one surrounder comprises at least one penetrator structured and arranged to penetrate the at least one soil; and wherein such at least one surrounder comprises a first plurality of apertures structured and arranged to receive at least one frame ladder structured and arranged to assist upward plant growth. Moreover, it provides such a system further comprising at least one frame ladder attachable to such at least one surrounder and extending upward from such at least one surrounder. Additionally, it provides such a system wherein such at least one frame ladder comprises at least one leg portion structured and arranged to be useable to couple such at least one frame ladder to such at least one surrounder. Also, it provides such a system wherein such first plurality of apertures comprises seven apertures structured and arranged to support at least a three-legged frame or a four-legged frame ladder. In addition, it provides such a system wherein such at least one frame ladder comprises at least one cage structured and arranged to assist upward plant growth. And, it provides such a system wherein such first plurality of apertures are positioned on a top portion of such at least one surrounder. Further, it provides such a system wherein such first plurality of apertures are positioned on a sidewall portion of such at least one surrounder.

Even further, it provides such a system wherein such surrounder further comprises at least one second plurality of apertures structured and arranged to provide passage to laterally expanding plantus roots. Moreover, it provides such a system wherein such at least one surrounder comprises: at least one inner face situate on the innermost diameter of such at least one surrounder; and at least one anchor structured and arranged to anchor such at least one surrounder to the at least one soil; wherein such at least one anchor is situate along such at least one inner face. Additionally, it provides such a system wherein such at least one anchor comprises at least one flange situate along such at least one inner face. Also, it provides such a system wherein such at least one flange comprises at least one sloped portion sloping from such at least one inner face to an about v-shaped edge and sloping upwardly and outwardly therefrom to create at least one trough-shaped flange. In addition, it provides such a system wherein such at least one surrounder comprises: at least one first portion; at least one second portion; and at least one connector structured and arranged to connect such at least one first portion and such at least one second portion. And, it provides such a system wherein such at least one connector comprises: at least one channeled connecting member to receive such at least one first portion and such at least one second portion; and at least one fastener to secure such at least one channeled connecting member to such at least one surrounder.

Further, it provides such a system wherein such at least one connector further comprises two pins insertable into

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such at least one channeled connecting member and at least one clip connected opposite such two pins. Even further, it provides such a system wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surround during penetration. Moreover, it provides such a system wherein such at least one surround comprises at least one expander element structured and arranged to expand the fluid capacity of such at least one surround. Additionally, it provides such a system wherein: such at least one expander element comprises at least one first surround layer and at least one second surround layer; and such at least one second surround layer extends away from such at least one first surround layer, expanding the fluid capacity of such at least one surround immediately surrounding the at least one plantus. Also, it provides such a system wherein such at least one surround comprises at least one fluid transmitter structured and arranged to transmit at least one fluid from the at least one fluid source. In addition, it provides such a system wherein such at least one fluid transmitter comprises at least one sprinkler. And, it provides such a system wherein such at least one penetrator comprises at least one tooth.

In accordance with another preferred embodiment hereof, this invention provides a system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: at least one surround structured and arranged to radially surround the at least one plantus; wherein such at least one surround comprises at least one container structured and arranged to contain the at least one fluid when such at least one surround is embedded in the at least one soil; wherein such at least one surround comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; wherein such at least one surround comprises at least one penetrator structured and arranged to penetrate the at least one soil; wherein such at least one surround comprises at least one protector structured and arranged to protect the at least one plantus; wherein such at least one surround comprises at least one anchor structured and arranged to anchor such at least one surround to the at least one soil; and wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surround during penetration.

In accordance with another preferred embodiment hereof, this invention provides a system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: surround means for radially surrounding the at least one plantus; wherein such surround means comprises container means for containing the at least one fluid; wherein such surround means comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; and wherein such surround means comprises penetrator means for penetrating the at least one soil.

In accordance with a preferred embodiment hereof, this invention provides a system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising: at least one surround structured and arranged to radially surround the at least one plantus; wherein such at least one surround comprises at least one container structured and arranged to contain the at least one fluid when such at least one surround is embedded in the at least one soil; wherein such at least one surround comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil; wherein such at

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least one surround comprises at least one penetrator structured and arranged to penetrate the at least one soil; wherein such at least one surround comprises at least one protector structured and arranged to protect the at least one plantus; wherein such at least one surround comprises at least one anchor structured and arranged to anchor such at least one surround to the at least one soil; and wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surround during penetration.

Moreover, it provides such a system wherein such at least one surround comprises a first plurality of apertures structured and arranged to receive at least one frame ladder structured and arranged to assist upward plant growth. Additionally, it provides such a system further comprising at least one frame ladder attachable to such at least one surround and extending upward from such at least one surround. Also, it provides such a system wherein such at least one frame ladder comprises at least one leg portion structured and arranged to be useable to couple such at least one frame ladder to such at least one surround. In addition, it provides such a system wherein such first plurality of apertures comprises seven apertures structured and arranged to support at least a three-legged frame or a four-legged frame ladder. And, it provides such a system wherein such at least one frame ladder comprises at least one cage structured and arranged to assist upward plant growth.

Further, it provides such a system wherein such first plurality of apertures are positioned on a top portion of such at least one surround. Even further, it provides such a system wherein such first plurality of apertures are positioned on a sidewall portion of such at least one surround. Moreover, it provides such a system wherein such surround further comprises at least one second plurality of apertures structured and arranged to provide passage to laterally expanding plantus roots. Additionally, it provides such a system wherein such at least one anchor comprises at least one flange situate along such at least one inner face.

Also, it provides such a system wherein such at least one flange comprises at least one sloped portion sloping from such at least one inner face to an about v-shaped edge and sloping upwardly and outwardly therefrom to create at least one trough-shaped flange. In addition, it provides such a system wherein such at least one surround comprises: at least one first portion; at least one second portion; and at least one connector structured and arranged to connect such at least one first portion and such at least one second portion. And, it provides such a system wherein such at least one connector comprises: at least one channeled connecting member to receive such at least one first portion and such at least one second portion; and at least one fastener to secure such at least one channeled connecting member to such at least one surround. Further, it provides such a system wherein such at least one connector further comprises two pins insertable into such at least one channeled connecting member and at least one clip connected opposite such two pins. Even further, it provides such a system wherein such at least one penetrator comprises at least one holder structured and arranged to hold such at least one surround during penetration. Even further, it provides such a system wherein such at least one surround comprises at least one expander element structured and arranged to expand the fluid capacity of such at least one surround.

Even further, it provides such a system wherein: such at least one expander element comprises at least one first surround layer and at least one second surround layer; and such at least one second surround layer extends away

from such at least one first surround layer, expanding the fluid capacity of such at least one surround immediately surrounding the at least one plantus. Even further, it provides such a system wherein such at least one surround comprises at least one fluid transmitter structured and arranged to transmit at least one fluid from the at least one fluid source. Even further, it provides such a system wherein such at least one fluid transmitter comprises at least one sprinkler. Even further, it provides such a system wherein such at least one penetrator comprises at least one tooth. Even further, it provides such a system wherein such at least one surround comprises at least one nested-stacking element structured and arranged to assist nested stacking of a plurality of such at least one surrounds.

In accordance with another preferred embodiment hereof, this invention provides each and every novel feature, element, combination, step and/or method disclosed or suggested by this patent application.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A shows a cross-sectional view of the water rounds system, according to a preferred embodiment of the present invention.

FIG. 1B shows a perspective view of a water round apparatus, according to the preferred embodiment of FIG. 1A.

FIG. 2A shows a perspective view of a water round apparatus transmitter, prior to use, according to another preferred embodiment of the present invention.

FIG. 2B shows a perspective view of a water round apparatus transmitter, in use, according to the preferred embodiment of FIG. 2A.

FIG. 3 shows a top view of a water round apparatus, according to another preferred embodiment of the present invention.

FIG. 4 shows a cross-sectional view of a water round apparatus, according to another preferred embodiment of the present invention.

FIG. 5 shows a cross-sectional view of a water round apparatus, according to another preferred embodiment of the present invention.

FIG. 6 shows a front view of a water round of the water rounds system comprising a tomato cage, according to a preferred embodiment of the present invention.

FIG. 7 shows a schematic illustration showing the relationship of apertures of a water round of FIG. 6 and FIG. 9, according to a preferred embodiment of the present invention.

FIG. 8 shows a side view of the water round of FIG. 6 placed into the ground.

FIG. 9 shows a front view of a water round comprising a tomato cage, according to another preferred embodiment of the present invention.

FIG. 10 shows a side view of the water round of FIG. 9 placed into the ground.

FIG. 11 shows a side view of a water round similar to that of FIG. 8 and FIG. 9 with additional apertures for lateral root expansion, according to a preferred embodiment of the present invention.

FIG. 12 shows a perspective view, illustrating another preferred embodiment of water rounds system which may be installed around an existing tree or plant comprising a connection assembly, according to a preferred embodiment of the present invention.

FIG. 13A shows a connecting member of another preferred embodiment of water rounds system.

FIG. 13B shows a preferred coupler according to the preferred embodiment of FIG. 12.

FIG. 14 shows a cross-sectional view of the section B-B of FIG. 13A.

FIG. 15 shows a perspective view of another preferred connector of the water rounds system according to another preferred embodiment of the present invention.

FIG. 16 shows a perspective view of the preferred embodiment of FIG. 15.

FIG. 17 shows a perspective view of another preferred connector of the water rounds system according to another preferred embodiment of the present invention.

FIG. 18 shows a perspective view of the preferred embodiment of FIG. 17.

FIG. 19 shows a perspective view of another preferred connector of the water rounds system according to another preferred embodiment of the present invention.

FIG. 20 shows a perspective view of Detail 7 of the preferred embodiment FIG. 19.

FIG. 21 shows a top view of the preferred embodiment FIG. 19.

FIG. 22 shows a bottom view of the preferred embodiment of FIG. 19.

FIG. 23 shows a front perspective view of a water round of the water rounds system comprising a tomato cage, according to a preferred embodiment of the present invention.

FIG. 24 shows an enlarged front perspective view of a water round of the water rounds system utilized with a tomato cage, according to a preferred embodiment of FIG. 23.

FIG. 25 shows a cross-sectional view of section C-C of FIG. 24.

FIG. 26 shows a front perspective view of a water round of the water rounds system comprising a tomato cage, according to a preferred embodiment of the present invention.

FIG. 27 shows an enlarged front perspective view of a water round of the water rounds system utilized with a tomato cage, according to a preferred embodiment of FIG. 26.

DETAILED DESCRIPTION OF THE BEST MODES AND PREFERRED EMBODIMENTS OF THE INVENTION

FIG. 1A shows a cross-sectional view of a water rounds system 100 according to a preferred embodiment of the present invention. Water rounds system 100 is preferably related to providing a fluid 202 from a fluid source 208 (best viewed on FIG. 2A) a plantus 200 embedded in soil 204. Water rounds system 100 preferably provides increased exposure of fluid 202 to roots 207, providing a slow, deep, penetrating irrigation to plantus 200. Water rounds system 100 preferably also allows plantus 200 to become stronger, healthier, and more stable, as the roots 207 of plantus 200 will preferably be more deeply established as the roots preferably will follow the gravitational path 209 of fluid 202 deeper into soil 204, and will be provided with more root surface area exposure to fluid 202, as well as greater access to deeper and richer soil 204.

Based on Robert Whittaker's Five-Kingdom System, plantus 200 preferably comprises kingdom plantae, kingdom fungi, kingdom protista, and kingdom monera. More specifically, plantus 200 preferably comprise plants 300, preferably plants 300 comprising plant roots 307, as shown. Upon reading the teachings of this specification, those of

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ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as biology, technology, etc., other plantus, such as, trees, shrubs, herbs, vegetables, mushrooms, other living things requiring exposure to fluids, other living things comprising root systems, etc., may suffice.

Soil 204 preferably comprises planting soil 304, as shown. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as conditions, geography, plantus, climate, convenience, cost, market demand, technology, etc., other soils, such as, dirt, sand, grain, gravel, other granular materials, other root system supporting mediums, etc., may suffice.

Fluid 202 preferably comprises water 302, preferably mostly water, as shown. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as soil, plantus, climate, convenience, cost, market demand, technology, etc., other fluids, such as, Miracle-Gro®, fluids comprising nutrients, other mixtures, etc., may suffice.

FIG. 1B shows a perspective view of a water round apparatus 101, according to the preferred embodiment of FIG. 1A.

System apparatus 101 preferably comprises surround 110 and penetrator 120, as shown. Surround 110 (at least herein embodying surround means for radially surrounding the at least one plantus) preferably comprises a radial surround 110, with respect to plantus 200, as shown. Surround 110 preferably comprises at least one container 112 (at least herein embodying container means for containing the at least one fluid), preferably able to hold a fluid 202 in container 112, preferably when such container 112 is anchored to planting soil 304, preferably preventing fluid 202 from escaping the area surrounding roots 207, as shown.

Container 112 preferably comprises reservoir 312, as best shown in FIG. 1A. Surround 110 preferably comprises inner surface 114, extending from a near edge 121 near soil 206, to a far edge 122 away from soil 206. Near edge 121 comprises inner face 114' preferably comprising a portion of inner surface 114. Preferably, near edge 121 is more than approximately three inches from far edge 122, so as to preferably provide at least three inches of penetration depth. In addition, far edge 122 preferably tapers away from plantus 200 with respect to near edge 121, preferably providing a v-shaped cross-section, so as to provide greater containment capacity while funneling fluid 202 over roots 207, as best shown in FIG. 1A.

Penetrator 120 (at least herein embodying penetrator means for penetrating the at least one soil) preferably penetrates soil 204, preferably so as to prevent fluid 202 from leaking out from under the near edge 121 of container 112, as shown. Penetrator

120 preferably comprises holder 140 (at least herein embodying holder means for holding said surround means during penetration), preferably a holder 140 comprising contours 141, preferably so as to permit a user of system apparatus 101 to hold surround 110 during penetration, preferably penetration by twisting and pressing surround 110 into soil 204. Penetrator 120 preferably comprises teeth 320, preferably along near edge 121, preferably such that near edge 121 may penetrate to a depth of at least about three inches. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as

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soil, cost, convenience, market demand, technology, etc., other penetrators, such as, spikes, hooks, sharp edges, other non-teeth, etc., may suffice.

As best shown in FIG. 1A, surround 110 preferably comprises an anchor 111 (at least herein embodying anchor means for anchoring said surround means into the at least one soil), preferably at least one anchoring protrusion 311, so as to provide anchoring of surround 110 into soil 204, as shown. Anchor 111 preferably comprises an upwardly-facing V-shaped flange 125, preferably encircling the inner diameter of surround 110, as shown. In such manner, a user may manipulate the surround 110 to preferably penetrate the soil with teeth 320, preferably by rotation of the surround or "sawing" motion. This arrangement provides utilizing the smallest outer circumference of surround 110; and, comprises at least anchoring along the inner surround circumference by upwardly-facing V-shaped flange 125 which preferably "pushes" against the soil to keep the surround anchored in place once buried into the soil. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as soil, market demand, cost, technology, etc., other anchor geometries, such as, U-shaped, W-shaped, etc., may suffice. In addition, upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other added anchor arrangements such as, for example, hooks, spikes, attachers, adhesives, other non-kicks, etc., may suffice.

As best shown in FIG. 1A, surround 110 preferably comprises protector 146 (at least herein embodying protector means for protecting the at least one plantus), preferably walls 346 (see inset on FIG. 1A), preferably comprising plastic, as shown, preferably so as to protect plantus 200 from debris, erosion, etc., as shown. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as cost, convenience, market demand, technology, etc., other protectors, such as, blockers, shields, barriers, other non-wall configurations, etc., may suffice. Further, upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as manufacturing preference, cost, structural requirements, available materials, technological advances, etc., other materials for walls 346 such as, carbon-fiber, galvanized steel, fiberglass, etc., may suffice.

Preferred embodiments of surround 110 comprise a range of different diameters to work with various types of plants and trees. Preferably, such diameters will vary depending on the diameter and root system of the respective plants. Preferred embodiments of surround 110 will also further preferably comprise various color options, such as, colored plastic, colored parts, etc.

FIG. 2A shows a perspective view of a water round apparatus water transmitter 170, prior to use, according to another preferred embodiment of the present invention. FIG. 2B shows a perspective view of a water round apparatus transmitter 170, in use, according to the preferred embodiment of FIG. 2A. In the preferred embodiment of FIG. 2, surround 110 preferably comprises a transmitter 170 (at least herein embodying transmitter means for transmitting the at least one fluid from the at least one fluid source) that preferably transmits fluid 202, preferably water, preferably

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from fluid source **208**, preferably to the area surrounding plantus **200**, as shown. Water rounds system apparatus transmitter **170** preferably comprises a sprinkler **370**. In addition, water rounds system apparatus transmitter **170** preferably comprises an intake **379**. Sprinkler **370** preferably sprinkles fluid **202** onto the soil **204** surrounding roots **207**. Alternatively preferably, water rounds system apparatus transmitter **170** could be directed away from surrounder **110**, so as to transmit fluid **202** to areas outside of reservoir **312**, such as to surrounding plantus **200**. Alternatively preferably, water rounds system apparatus transmitter **170** could transmit fluid **202** to a plurality of surrounders **110**, preferably “daisy-chained” along a water hose, preferably, such that fluid **202** transmits to a plurality of surrounders **110** simultaneously controlled by a single nozzle or fluid source **208**. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as cost, convenience, market demand, technology, etc., other transmitters, such as, drips, valves, sprayers, other sprinkler configurations, etc., may suffice.

Fluid source **208** preferably comprises at least one hose **308**, preferably a garden hose connected to a pressurized water source, such as a residential or commercial plumbing system, as shown in FIGS. **2A** and **2B**. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as cost, convenience, market demand, technology, etc., other fluid sources, such as, faucets, nozzles, valves, funnels, bowls, other fluid dispensers, water tanks, etc., may suffice.

FIG. **3** shows a top view of a water round apparatus **155** according to another preferred embodiment of the present invention. In the preferred embodiment of FIG. **3**, surrounder **110** preferably comprises first portion **151**, second portion **152**, and connector **150**. Connector **150** (at least herein embodying connector means for connecting said at least one first portion and said at least one second portion) preferably comprises plugs **156**, preferably so as to permit first portion **151** to connect to second portion **152**, preferably so as to provide ease of installation and removal from plantus **200**, in particular where plantus **200** is too large to lift surrounder **110** up, over and off of plantus **200**. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as cost, convenience, market demand, technology, etc., other connectors, such as engagers, clips, hooks, sliders, ties, other non-plugs, etc., may suffice.

FIG. **4** shows a cross-sectional view of a water round apparatus **201** according to another preferred embodiment of the present invention. In the preferred embodiment of FIG. **4**, surrounder **110** preferably comprises expander **160** (at least herein embodying expander means for expanding the capacity to contain the at least one fluid), preferably so as to provide expanded fluid **202** capacity. Expander **160** preferably comprises extender **165**, preferably comprising a first layer **161** and a second layer **162**, whereby second layer **162** extends away from first layer **161**, providing an increase in the size of the containment area around plantus **200**. Upon reading the teachings of this specification, those of ordinary skill in the art will now understand that, under appropriate circumstances, considering such issues as cost, convenience, market demand, technology, etc., other expanders, such as, coils, inflators, other non-extendors, etc., may suffice.

Additionally, FIG. **4** illustrates that multiple water rounds may be stacked or nested closely adjacent to one another, as

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shown by first layer **161** and a second layer **162** stacking/nesting. Preferably, such stacking/nesting **167** provides benefit for retail sales (more product in less space) and shipping advantage (more product in less packaging space). The above described arrangement and illustrated drawings at least embodying herein, wherein said at least one surrounder comprises at least one nested-stacking element structured and arranged to assist nested stacking of a plurality of said at least one surrounders.

FIG. **5** shows a cross-sectional view of a water round apparatus **301** according to another preferred embodiment of the present invention. Preferably, the distance between an outer edge **123** and far edge **122**, slopes, so as to provide for adequate containment where a plantus **200** is, for example, on a hillside, preferably so as to accommodate the particular degree of the hillside, as shown. In other words, in this example scenario, the downhill side of surrounder **110** is thicker than the uphill side of surrounder **110**, as shown in FIG. **5**. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as manufacturing preference, cost, structural requirements, available materials, technological advances, etc., other sloping arrangements such as, angled edges, taller and shorter walls, etc., may suffice.

FIG. **6** shows a front view of a water round of the water rounds system **100** comprising a cage **605**, according to a preferred embodiment of the present invention. FIG. **6** shows water rounds embodiment **601**. Water rounds embodiment **601** preferably comprises base **610** (system apparatus **101** as shown in FIG. **1B**), cage **605**, and apertures **615**, as shown. Cage **605** provides a frame ladder or scaffold for plants such as tomato plants, preferably at least tomato plants. Alternately preferably, water rounds embodiment **601** preferably comprises at least one frame ladder (not necessarily a cage) circumferential with the water round. FIG. **6** shows a three-legged cage. The aperture arrangement (described more particularly in FIG. **7**) may also accept a four-legged cage as shown in FIG. **9**. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other cage arrangements such as, for example, more or less legs, other attachment means, etc., may suffice.

Preferably, base **610** contains preferably seven of apertures **615** arranged on the top portion of base **600**, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other aperture arrangements such as, for example, other numbers of apertures, other aperture geometries, etc., may suffice. Under appropriate circumstances, other numbers of apertures **615** may suffice. The apertures are sized to accept the legs of cage **605**, as shown. Apertures **615** are preferably about one-quarter inch in diameter. Under appropriate circumstances, other aperture diameters may suffice. The legs of cage **605** preferably extend into surrounder **110** (see FIG. **1A**). In use, water rounds embodiment **601** is preferably placed into the ground surrounding a tomato plant or vegetable plant to support the growth of the plant. The configuration of base **610** assists in delivering water to the root system of the surrounded plant as discussed herein. Base **610** is preferably circular in construction with a preferred diam-

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eter of about 16 inches. Under appropriate circumstances, other diameters (larger or smaller) of base may suffice.

FIG. 7 shows a schematic illustration showing the relationship of apertures of a water round of FIG. 6 and FIG. 9 according to preferred embodiments of the present invention. Apertures 615 preferably comprise seven apertures A through G, as shown. For purposes of this description, angles herein are measured counterclockwise from Aperture A. Preferably, apertures B, D, E, and G are configured to accept a four-legged cage as shown in FIG. 9. Preferably, aperture B is located about 45 degrees from Aperture A. Preferably, aperture D is located about 135 degrees from Aperture A. Preferably, aperture E is located about 225 degrees from Aperture A. Preferably, aperture G is located about 315 degrees from Aperture A. Preferably, apertures A, C, and F are configured to accept a three-legged cage as shown in FIG. 6. Preferably, aperture C is located about 120-degrees from Aperture A. Preferably, aperture F is located about 240 degrees from Aperture A. Under appropriate circumstances, other angle values of the apertures may suffice.

FIG. 8 shows a side view of the water round of FIG. 6 placed into the ground. FIG. 8 further illustrates a method of anchoring the legs 607 of cage 605A (shown with four legs) into base 610. In a preferred embodiment, after inserting the leg into the appropriate one of aperture 615, preferably, the legs of cage 605 may be bent (preferably with a tool, such as a pair of pliers) so as to “hook” the base 610, as shown. The bending of the legs 607 of cage 605 assists in anchoring cage 605 relative to base 610, as shown. Alternately preferably, the legs 607 may be pre-bent and inserted from under the base 610. Under appropriate circumstances, other anchoring assistance may suffice, for example, the use of mechanical fasteners to prevent release of the legs from the apertures. The bending of the legs preferably occurs prior to installing base 610 into soil or ground.

FIG. 9 shows a front view of a water round comprising a cage 905 according to another preferred embodiment 900 of the present invention. Embodiment 900 preferably comprises base 910 (system apparatus 101 as shown in FIG. 1B), cage 905, and apertures 915, as shown. Embodiment 900 preferably is similar to water rounds embodiment 601 except for the placement of apertures 915. In embodiment 900 apertures 915 are found penetrating the sidewalls of base 910, as shown. In this arrangement, the ends of the legs 907 of cage 905 are preferably bent so as to insert at a relative right angle relative to the remaining upright leg portion of cage 905 (see FIG. 10), as shown. The legs 907 of cage 905 preferably pass through internal sidewall, through surrounder 110 (see FIG. 1A), and through external sidewall of base 910, as shown. This arrangement provides preferred weight distribution of cage 905 (which will support weight of a vegetable plant or tomato plant) on base 910. Apertures 915 are preferably one-quarter inch in diameter. Under appropriate circumstances, other diameters may suffice. Base 910 is preferably circular in construction with a diameter of about 16 inches. Under appropriate circumstances, other diameters (larger or smaller) of the base may suffice.

FIG. 10 shows a side view of the water round of FIG. 9 placed into the ground. FIG. 10 further illustrates a method of anchoring the legs 907 of cage 905 (only two legs are shown for clarity) into base 910. The ends of the legs 907 of cage 905 are preferably bent into roughly a 90-degree angle with a tool such as a pair of pliers. After bending, the ends of legs are inserted into the appropriate apertures 915 for anchoring. Under appropriate circumstances, other anchor-

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ing assistance may suffice, for example, the use of mechanical fasteners to prevent release of the legs from the apertures.

FIG. 11 shows a side view of water rounds system embodiments similar to that of FIG. 8 and FIG. 9 with additional apertures for lateral root expansion according to a preferred embodiment of the present invention. Preferably, root expansion apertures 1105 are of sufficient diameter, and are sufficiently placed, so as to allow the roots of the enclosed vegetable plant to expand beyond the perimeter of the water round system without substantial impediment to the plant's growth. Root expansion apertures 1105 preferably comprise one-inch diameter bores in the sidewalls of the water rounds base 1000, as shown. Preferably, root expansion apertures 1105 are regularly spaced along the entire perimeter of the water rounds base 1000. Preferably, the center of each root expansion aperture 1105 is located approximately 2.5 inches from the centers of adjoining apertures, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other aperture arrangements such as, for example, some high, some low, differing diameter apertures, other geometries (square, triangular, etc), slots, etc., may suffice.

FIG. 12 shows a perspective view illustrating another preferred embodiment of water rounds system 100, which may be installed around an existing tree or plant, comprising a connection assembly 1205 according to another preferred embodiment of the present invention. This embodiment comprises a transverse perforation in both base portions 1200 and 1210, creating a transverse separation 1215 in the circular sidewalls. Separation 1215 assists placement of water round assembly 1225 around a tree or large shrub which is otherwise too large to accept an unbroken water round over the top of such plant. After placement around a tree or shrub, separation 1215 in the water round preferably is coupled closed by connection assembly 1205 preferably closely adjoining the circular portion with a preferably butt-joint couple, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other coupling arrangements such as, for example, use to increase the diameter of the water round assembly, maintaining a larger gap when coupled, etc., may suffice.

FIG. 13A shows a perspective view of connection assembly 1205 according to another preferred embodiment of the present invention. Connection assembly 1205 preferably comprises connecting member 1355, pins 1305, and clip 1345, as shown. Connection assembly 1205 preferably provides a rigid connection, preferably sealing separation 1215. Alternately preferably, connection assembly 1205 preferably provides at least a sealed connection (whether rigid, semi-rigid or flexible) sealing separation 1215, as shown. The edges of the sidewall from each respective end of separation 1215 preferably are inserted within the recesses 1330 and 1340 of connecting member 1355, as shown. Pins 1305 are then preferably inserted into apertures 1315 and snapped into place. Separation 1215 preferably is sealed by inserting one penetrator 120 (preferably at least one tooth as shown) from the water round from each side of separation 1215 into the apertures 1350 of clip 1345. Clip 1345

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preferably comprises an upper lip that is snapped behind the lower interior lip of the water round, thereby locking clip **1345** in place, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other connection arrangements such as, for example, greater than dual pin arrangements, single pin arrangements, rivets, other fastener arrangements, adhesive attachment, etc., may suffice.

FIG. **13A** shows pins **1305** and a connecting member **1355** of the water rounds system **100** of FIG. **12**. Connecting member **1355** preferably is a single monolithic piece preferably comprising a shorter portion **1325**, a longer portion **1335**, and a flexible middle portion **1320**, as shown. Longer portion **1355** preferably comprises an inner recess (or channels) **1340** that is sufficiently wide so as to permit insertion of the sidewall (thickness) of a respective water round, as shown.

Preferably, the width of inner recess **1340** is substantially equal to the thickness of the sidewall. Likewise, shorter portion **1325** preferably comprises an inner recess **1330** that is sufficiently wide so as to permit insertion of the sidewall of the water round system. Preferably, the width of inner recess **1330** is substantially equal to the thickness of the sidewall.

The flexible middle portion **1320** preferably comprises two apertures **1315**. Preferably, apertures **1315** are sized for use with pins **1305**. Pins **1305** preferably comprise smooth thumb-pressed rounded heads and tapered bodies, as shown. Preferably, the tapered bodies of pins **1305** comprise a slight bulge in their midportion, as shown. Preferably, apertures **1315** comprise diameters slightly less than the diameter of the bulging midpoint of pins **1305**. Pins **1305** preferably comprise a rust proof material, preferably substantially 100% plastic, alternately preferably, substantially 100% rubber. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other material arrangements such as, for example, stainless steel, carbon-fiber, aluminum, wood, etc., may suffice.

FIG. **13B** shows a preferred coupler according to the preferred embodiment of FIG. **12**. Coupler **1345** preferably comprises an upper lip structured and arranged to engage with the lower interior lip of the water round system. Coupler **1345** further comprises a lower lip comprising two apertures **1350**. Apertures **1350** preferably are each large enough to accept one penetrator **120** on the bottom of the water round, as shown. Coupler **1345** preferably comprises a non-rust surface, preferably made of metal, alternately preferably plastic. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other material arrangements such as, for example, stainless steel, carbon-fiber, aluminum, wood, etc., may suffice. In use, coupler **1345** preferably adjoins and couples together each respective transverse separation **1215** in the circular sidewalls of base portions **1200** and **1210**, preferably creating a sealed separation, as shown.

FIG. **14** shows a cross-sectional view of the section B-B of FIG. **13A**. Longer portion **1355** preferably comprises an

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inner recess **1340** that is sufficiently wide as to permit insertion of the sidewall of the water round system. Preferably, the width of inner recess **1340** is substantially equal to the thickness of the sidewall. Likewise, shorter portion **1325** preferably comprises an inner recess **1330** that is sufficiently wide as to permit insertion of the sidewall of the water round, as shown. Preferably, the thickness of inner recess **1330** is substantially equal to the thickness of the sidewall so as to permit a tight frictional fit.

It is further noted that water rounds system **100**, system apparatus **101**, base **610**, base **910**, etc., are preferably made of essentially 100% plastic. Preferably, recycled plastic is used, preferably a copolymer polypropylene. Under appropriate circumstances, other recycled or non-recycled plastics may suffice.

In another preferred embodiment, water rounds system **100**, system apparatus **101**, base **610**, base **910**, etc., may be made to resemble materials other than plastic, such as rock, brick, wood, etc. Creating resembling looks would be accomplished using molding techniques and colored plastics to match the item which is to be resembled.

FIG. **15** shows a perspective view of another preferred connector of the water rounds system **100** according to another preferred embodiment of the present invention. FIG. **16** shows a perspective view of the preferred embodiment of FIG. **15**. Connection assembly **1505** preferably comprises an overlap joint attachment **1530** in combination with an upper snap-spring button assembly **1510** and a lower tooth and slot assembly **1520**, as shown. Connection assembly **1505** preferably provides a coupled connection that couples the two separated portions of the water round together, as shown. Preferably, overlap joint attachment **1530** comprises a respective inner facing lip **1535** and outer facing lip **1536** both preferably comprising about 50% of the thickness of the water round material and extending about one-eighth-inch to about one-quarter-inch outwardly, as shown. Preferably, the two portions inner facing lip **1535** and outer facing lip **1536** overlap each other when placed together, as shown. To maintain each respective portion and a coupled position, the present embodiment utilizes upper snap-spring button assembly **1510** and a lower tooth and slot assembly **1520**, as shown.

Upper snap-spring button assembly **1510** comprises a preferably integrally formed button protrusion **1540** that preferably inserts from beneath and preferably upwardly into, aperture **1545**, as shown. Preferably, button protrusion **1540** is situated on a tab extension **1550** that preferably is made of flexible material with a spring-like function to allow button protrusion **1540** to be put under and snap into aperture **1545**, as shown.

Lower tooth and slot assembly **1520** preferably comprises an extended tooth portion **1555** structured and arranged so as to be able to lock into a recess **1560**, preferably a recess above a respective formed penetrator (tooth) **120**, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other tooth coupling arrangements such as, for example, in the slot between each respective tooth, etc., may suffice.

FIG. **17** shows a perspective view of another preferred connector of the water rounds system **100** according to another preferred embodiment of the present invention. FIG. **18** shows a perspective view of the preferred embodiment of FIG. **17**. Connection assembly **1605** preferably comprises an overlap joint attachment **1630** in combination with an upper

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snap-spring button assembly **1610** and a lower tooth and slot assembly **1620**, as shown. Connection assembly **1605** preferably provides a coupled connection that couples the two separated portions of the water round together, as shown. Preferably, overlap joint attachment **1630** comprises a respective inner facing lip **1635** and outer facing lip **1636**, both preferably comprising about 50% of the thickness of the water round material and extending about one-eighth-inch to about one-quarter-inch outwardly, as shown. Preferably, the two portions inner facing lip **1635** and outer facing lip **1636** overlap each other when placed together, as shown. To maintain each respective portion and a coupled position the present embodiment utilizes upper snap-spring button assembly **1610** and a lower tooth and slot assembly **1620**, as shown.

Upper snap-spring button assembly **1610** comprises a preferably integrally formed button protrusion **1640** that preferably inserts from beneath and upwardly into, aperture **1645**, as shown. Preferably, button protrusion **1640** is situated on a tab extension **1650** that preferably is made of flexible material with a spring-like function to allow button protrusion **1640** be put under and snap into aperture **1645**, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other button arrangements such as, for example, extended on a flap, multiple buttons, etc., may suffice.

Lower tooth and slot assembly **1620** preferably comprises an extended tooth portion **1655** structured and arranged so as to be able to lock into at least one recess **1660**, preferably a single recess above a respective formed penetrator **120**, preferably the second tooth portion from the overlap joint attachment **1630**, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other tooth coupling arrangements such as, for example, in the slot between each respective tooth, etc., may suffice.

Further, extended tooth portion **1655** preferably may comprise a separate piece (not integral to the water round base portion) that can lock into a respective recess **1660** on both sides of the overlap joint attachment **1630**, as shown.

Additionally, the water rounds systems components described herein may be of larger diameters (or smaller). Preferably water rounds system **100** is preferably about 20 inches in diameter, preferably about 24 inches in diameter, preferably about 36 inches in diameter, and preferably about 48 inches in diameter.

FIG. **19** shows a perspective view of another preferred connector assembly of the water rounds system according to another preferred embodiment of the present invention. FIG. **20** shows a perspective view of Detail **20** of the preferred embodiment FIG. **19**. FIG. **21** shows a top view of the preferred embodiment of FIG. **19**. FIG. **22** shows a bottom view of the preferred embodiment of FIG. **19**.

Connector assembly **1700** preferably comprises an overlap joint attachment **1710** in combination with an upper button assembly **1720** and an upper tooth and slot assembly **1730**, as shown. Connector assembly **1700** preferably provides a coupled connection that assists coupling the two separated portions of the water round together at the upper portion **1715**, as shown. Preferably, overlap joint attachment **1730** comprises a respective inner facing lip **1735** and outer

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facing lip **1740** both preferably comprising about 50% of the thickness of the water round material and extending about one-eighth-inch to about one-quarter-inch outwardly, as shown. Preferably, the two portions inner facing lip **1735** and outer facing lip **1740** overlap each other when placed together, as shown.

Preferably, upper button assembly **1720** comprises a preferably integrally formed button protrusion **1725** that preferably inserts from above, and preferably downwardly into, aperture **1728**, as shown. Preferably, button protrusion **1725** is fixed on the underside of the top **1738** of outer facing lip **1740**, as shown. Aperture **1728** preferably is situated on top **1744** of inner facing lip **1735**, as shown.

Upper tooth and slot assembly **1730** preferably comprises an extended tooth portion **1755** structured and arranged so as to be able to lock into a recess **1760**, preferably a recess along the upper outer rim **1765** of the outer ring portion **1770**, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other tooth-coupling arrangements such as, for example, in the slot between each respective tooth, etc., may suffice. Upper outer rim **1765** of the outer ring portion **1770** preferably comprises at least one ridge **1780**, preferably circumferential to the entire outer ring portion **1770**, preferably assisting rigidity and strengthening of the outer ring portion **1770**, as shown.

In use, the separated surrounder **110** is placed around a plant and connector assembly **1700** comprising an overlap joint attachment **1710** in combination with an upper button assembly **1720** and an upper tooth and slot assembly **1730** is utilized to couple upper portion while coupler **1345** preferably adjoins and couples together each respective transverse separation **1215** in the circular sidewalls of base portions **1200** and **1210**, preferably adjoin both upper and lower sections of surrounder **110**, creating a sealed separation, as shown (in FIG. **12**). Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other coupling arrangements such as, for example, other combinations of couplings as described herein, other coupling arrangements, etc., may suffice.

FIG. **23** shows a front perspective view of a water round of the water rounds system **100** comprising a cage **605**, according to a preferred embodiment of the present invention. FIG. **24** shows an enlarged front perspective view of a water round of the water rounds system **100** utilized with a cage **605**, according to a preferred embodiment of FIG. **23**. FIG. **25** shows a cross-sectional view of section C-C of FIG. **24**. While many of the features of water rounds embodiment **1800** are retained from water rounds embodiment **601**, particularly cage **605**, apertures **615**, surrounder **110** and base **610**, base **610** of water rounds embodiment **1800** further comprises at least one surrounding flange **1810** and apertures **1820**, as shown.

FIG. **23**, FIG. **24**, and FIG. **25** show water rounds embodiment **1800**. Water rounds embodiment **1800** preferably comprises base **610** (system apparatus **101** as shown in FIG. **1B**), cage **605**, and apertures **615**, as shown. Cage **605** provides a frame ladder or scaffold for plants such as tomato plants, preferably at least tomato plants. Alternately preferably, water rounds embodiment **1800** preferably comprises at least one frame ladder (not necessarily a cage) circum-

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ferential with the water round. FIG. 23 shows a three-legged cage. The aperture arrangement (described more particularly in FIG. 7) may also accept a four-legged cage as shown in FIG. 9. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other cage arrangements such as, for example, more or less legs, other attachment means, etc., may suffice.

Preferably, base 610 contains preferably seven of apertures 615 arranged on the top portion of base 610, as shown. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other aperture arrangements such as, for example, other numbers of apertures, other aperture geometries, etc., may suffice. Under appropriate circumstances, other numbers of apertures 615 may suffice. The apertures are sized to accept the legs of cage 605, as shown. Apertures 615 are preferably about one-quarter inch in diameter. Under appropriate circumstances, other aperture diameters may suffice.

The legs of cage 605 preferably extend into surrounder 110 (see FIG. 1A). In use, water rounds embodiment 1800 is preferably placed into the ground surrounding a tomato plant or vegetable plant to support the growth of the plant. The configuration of base 610 assists in delivering water to the root system of the surrounded plant as discussed herein. Base 610 is preferably circular in construction with a preferred diameter of about 16 inches. Under appropriate circumstances, other diameters (larger or smaller) of base may suffice.

Surrounding flange 1810 (at least embodying herein at least one surrounding flange structured and arranged to surround outer perimeter of such at least one surrounder) preferably extends all the way around the perimeter of outer edge 123, as shown. Surrounding edge 1810 preferably comprises a width, extending radially outward from outer edge 123, of about $\frac{3}{8}$ inch (at least herein embodying wherein such at least one surrounding flange comprises a radial width of about $\frac{3}{8}$ inch). Apertures 1820 preferably penetrate outer face 1830 of wall 346, as shown. Apertures 1820 preferably are positioned about $1\frac{1}{2}$ inch above outer edge 123.

Structure of surrounding flange 1810 and apertures 1820 preferably permit legs 607 of cage 605 to extend through apertures 615 (at least embodying herein at least one upper aperture) then through apertures 1820 (at least embodying herein at least one lower aperture) and stop against surrounding flange 1810. In use, a user would apply pressure to outer face 1830 of base 610, insert leg 607 through aperture 615 and aperture 1820, then release applied pressure (this arrangement at least herein embodying wherein such at least one upper aperture and such at least one lower aperture align to permit insertion of the leg of the at least one support). Leg 607 preferably then deflects, as shown in FIG. 25, applying a two-point "pinch" on leg 607, preventing easy dislodging of cage 605 from base 610 (this arrangement at least herein embodying wherein such at least one support coupler comprises at least one dual-point leg engager structured and arranged to engage a leg of the at least one support in at least two points; and at least herein embodying wherein such support coupler means comprises dual-point leg engager means for engaging a leg of the at least one support in at least two points). In use, surrounding flange 1810 (at least

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embodying herein at least one leg stop structured and arranged to stop each leg insertion in such at least one support coupler at a common depth; and at least embodying herein leg stop means for stopping insertion of each leg of the at least one support in such support coupler means at a common depth) prevents legs 607 of cage 605 from being pressed into the soil and prevents tilting of cage 605 from varying penetration of legs 607. This arrangement at least herein embodies wherein such at least one surrounder comprises at least one support coupler structured and arranged to couple with at least one support structured and arranged to assist supporting the at least one plant; and this arrangement at least herein embodies wherein such surrounder means comprises support coupler means for coupling such surrounder means with at least one support structured and arranged to assist supporting the at least one plant.

Additionally, as surrounding flange 1810 extends outward from outer edge 123, surrounding flange 1810 preferably further provides stabilization to base 610 when installed in sandy or muddy soil, having a broader edge engaged with the soil (this arrangement at least herein embodies wherein such at least one surrounding flange comprises at least one stabilizer structured and arranged to stabilize such at least one surrounder in unstable soil).

Further, an additional vertical extension on surrounding flange 1810 preferably may be added, not shown. Such vertical extension preferably creates a pocket on surrounding flange 1810 in which leg 607 of cage 605 may engage, preferably preventing slipping beyond the edge of surrounding flange 1810.

Alternately, apertures 1820 preferably are positioned on the interior wall. In this alternate embodiment, leg 607 of cage 605 passes through aperture 615 and aperture 1820 and stop, engaged in anchor 111.

FIG. 26 shows a front perspective view of a water round of the water rounds system 100 comprising a cage 605, according to a preferred embodiment of the present invention. FIG. 27 shows an enlarged front perspective view of a water round of the water rounds system 100 utilized with a cage 605, according to a preferred embodiment of FIG. 26.

While many of the features of water rounds embodiment 1801 are retained from water rounds embodiment 1800, particularly cage 605, apertures 615, surrounder 110, base 610 and apertures 1820, on base 610 of water rounds embodiment 1801 at least one flange tab 1840 replaces surrounding flange 1810, as shown.

FIG. 26 and FIG. 27 shows water rounds embodiment 1801. Water rounds embodiment 1801 preferably comprises base 610 (system apparatus 101 as shown in FIG. 1B), cage 605, and apertures 615, as shown. Cage 605 provides a frame ladder or scaffold for plants such as tomato plants, preferably at least tomato plants. Alternately preferably, water rounds embodiment 601 preferably comprises at least one frame ladder (not necessarily a cage) circumferential with the water round. FIG. 26 shows a three-legged cage. The aperture arrangement (described more particularly in FIG. 7) may also accept a four-legged cage as shown in FIG. 9. Upon reading this specification, those with ordinary skill in the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other cage arrangements such as, for example, more or less legs, other attachment means, etc., may suffice.

Preferably, base 610 contains preferably seven of apertures 615 arranged on the top portion of base 610, as shown. Upon reading this specification, those with ordinary skill in

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the art will now appreciate that, under appropriate circumstances, considering such issues as design preference, user preferences, marketing preferences, cost, structural requirements, available materials, technological advances, etc., other aperture arrangements such as, for example, other numbers of apertures, other aperture geometries, etc., may suffice. Under appropriate circumstances, other numbers of apertures 615 may suffice. The apertures are sized to accept legs 607 of cage 605, as shown. Apertures 615 are preferably about one-quarter inch in diameter. Under appropriate circumstances, other aperture diameters may suffice. Legs 607 of cage 605 preferably extend into surround 110 (see FIG. 1A). In use, water rounds embodiment 1801 is preferably placed into the ground surrounding a tomato plant or vegetable plant to support the growth of the plant. The configuration of base 610 assists in delivering water to the root system of the surrounded plant as discussed herein. Base 610 is preferably circular in construction with a preferred diameter of about 16 inches. Under appropriate circumstances, other diameters (larger or smaller) of base may suffice.

Flange tab 1840 preferably aligns with apertures 1820. Flange tab 1840 preferably acts similar to surrounding flange 1810 with regard to leg 607 of cage 605, preferably stopping extension of leg 607 beyond flange tab 1840 (at least herein embodying wherein such at least one leg stop comprises at least one flange tab structured and arranged to align with such at least one upper aperture and such at least one lower aperture and extend from outer perimeter of such at least one surround) into the soil. As the primary difference between water rounds embodiment 1801 and water rounds embodiment 1800 lies with the alteration of surrounding flange 1810 to flange tab 1840, section D-D and section C-C appear identical in cross-section save for, appropriately, this same alteration. Therefore, FIG. 25 may serve, for general purposes as representative of cross-sections of both C-C and D-D save only in substituting reference number 1840 in place of reference number 1810, to understand section D-D.

Alternately, apertures 1820 preferably are positioned on the interior wall. In this alternate embodiment, leg 607 of cage 605 passes through aperture 615 and aperture 1820 and stop, engaged in anchor 111.

Although applicant has described applicant's preferred embodiments of this invention, it will be understood that the broadest scope of this invention includes modifications such as diverse shapes, sizes, and materials. Additionally, it is understood that where multiple features have been described in conjunction with specific embodiments, combinations of features from multiple embodiments is also envisioned, where such features are not mutually exclusive due to conflicting structure or function. Such scope is limited only by the below claims as read in connection with the above specification. Further, many other advantages of applicant's invention will be apparent to those skilled in the art from the above descriptions and the below claims.

What is claimed is:

1. A system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising:

- a) at least one surround structured and arranged to radially surround the at least one plantus;
- b) wherein said at least one surround comprises at least one container structured and arranged to contain the at least one fluid when said at least one surround is embedded in the at least one soil;

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c) wherein said at least one surround comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil;

d) wherein said at least one surround comprises at least one penetrator structured and arranged to penetrate the at least one soil;

e) wherein said at least one surround comprises at least one support coupler structured and arranged to couple with at least one support structured and arranged to assist supporting the at least one plantus; and

f) wherein said at least one support coupler comprises at least one dual-point leg engager structured and arranged to engage a leg of the at least one support in at least two points, and deflect the leg from linear; and

g) wherein, when engaged by said at least one dual-point leg engager, the portion of the leg of the at least one support between the at least two points of engagement is made non-linear; wherein said at least one dual-point leg engager comprises:

i) at least one upper aperture; and

ii) at least one lower aperture;

iii) wherein said at least one upper aperture and said at least one lower aperture align to permit insertion of the leg of the at least one support.

2. The system according to claim 1 further comprising the at least one support.

3. The system according to claim 2 wherein said at least one support comprises at least one cage.

4. The system according to claim 1 further comprising at least one leg stop structured and arranged to stop each leg insertion in said at least one support coupler at a common depth.

5. The system according to claim 4 wherein said at least one leg stop comprises at least one surrounding flange structured and arranged to surround outer perimeter of said at least one surround.

6. The system according to claim 5 wherein said at least one surrounding flange comprises at least one stabilizer structured and arranged to stabilize said at least one surround in unstable soil.

7. The system according to claim 6 wherein said at least one surrounding flange comprises a radial width of about $\frac{3}{8}$ inch.

8. The system according to claim 4 wherein said at least one leg stop comprises at least one flange tab structured and arranged to align with said at least one upper aperture and said at least one lower aperture and extend from outer perimeter of said at least one surround.

9. The system according to claim 1 wherein said at least one surround comprises:

a) at least one inner face situate on the innermost diameter of said at least one surround; and

b) at least one anchor structured and arranged to anchor said at least one surround to the at least one soil;

c) wherein said at least one anchor is situate along said at least one inner face.

10. The system according to claim 9 wherein said at least one anchor comprises at least one flange situate along said at least one inner face.

11. The system according to claim 10 wherein said at least one flange comprises at least one sloped portion sloping from said at least one inner face to an about v-shaped edge and sloping upwardly and outwardly therefrom to create at least one trough-shaped flange.

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12. The system according to claim 1 further comprising at least one stabilizer structured and arranged to stabilize said at least one surrounder in unstable soil.

13. The system according to claim 12 wherein said at least one stabilizer comprises at least one surrounding flange structured and arranged to surround outer perimeter of said at least one surrounder.

14. The system according to claim 13 wherein said at least one surrounding flange comprises a radial width of about $\frac{3}{8}$ inch.

15. The system according to claim 1 wherein said at least one surrounder comprises at least one fluid transmitter structured and arranged to transmit at least one fluid from the at least one fluid source.

16. The system according to claim 1 wherein said at least one penetrator comprises at least one tooth.

17. The system according to claim 1 wherein said at least one surrounder comprises at least one nested-stacking geometry structured and arranged to permit nested stacking of a plurality of surrounders.

18. A system, related to assisting at least one fluid from at least one fluid source to at least one plantus embedded in at least one soil, comprising:

- a) surrounder means for radially surrounding the at least one plantus;
- b) wherein said surrounder means comprises container means for containing the at least one fluid when said surrounder means is embedded in the at least one soil;

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c) wherein said surrounder means comprises at least one inner surface extending from a near edge, near the at least one soil, to a far edge, away from the at least one soil;

d) wherein said surrounder means comprises penetrator means for penetrating the at least one soil;

e) wherein said surrounder means comprises support coupler means for coupling said surrounder means with at least one support structured and arranged to assist supporting the at least one plantus; and

f) wherein said support coupler means comprises dual-point leg engager means for engaging a leg of the at least one support in at least two points, and deflect the leg from linear; and g) wherein, when engaged by said dual-point leg engager means, the portion of the leg of the at least one support between the at least two points of engagement is made non-linear; wherein said dual-point leg engager means comprises:

- i) at least one upper aperture; and
- ii) at least one lower aperture;
- iii) wherein said at least one upper aperture and said at least one lower aperture align to permit insertion of the leg of the at least one support.

19. The system according to claim 18 further comprising leg stop means for stopping insertion of a plurality of legs of the at least one support in said support coupler means at a common depth.

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